of America.

Good Reading about Automobiles, Motors and Cycles, and the People who Make and Use Them

VOL. I NEW SERIES No. 14

MOTOR AGE

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With Which is Incorporated THE CYCLE AGE

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CHICAGO, APRIL 3, 1902

Columbia Automobiles

ELECTRIC | **IN SEVENTH YEAR OF SUCCESSFUL SERVICE** | **GASOLINE**

Columbia Mark XXXI Runabout

This is our latest Runabout. Built on the successful lines of Gasoline Carriage construction. It has a double motor equipment, long wheel base, and the battery is divided so that the weight is equalized on both front and rear axles. Its radius on each charge is forty miles, and its maximum

SPEED, 13 MILES PER HOUR

WRITE FOR 1902 ILLUSTRATED CATALOGUE AND PRICE LIST

Electric Vehicle Co., Hartford, Conn.

Western Agency and Show Rooms, 267 WABASH AVENUE, CHICAGO

The Motor Age

A budget of good reading about Automobiles, Motors and Bicycles, and the people who make and use them.

ROMANS WILL BUILD FRENCH AUTOMOBILES

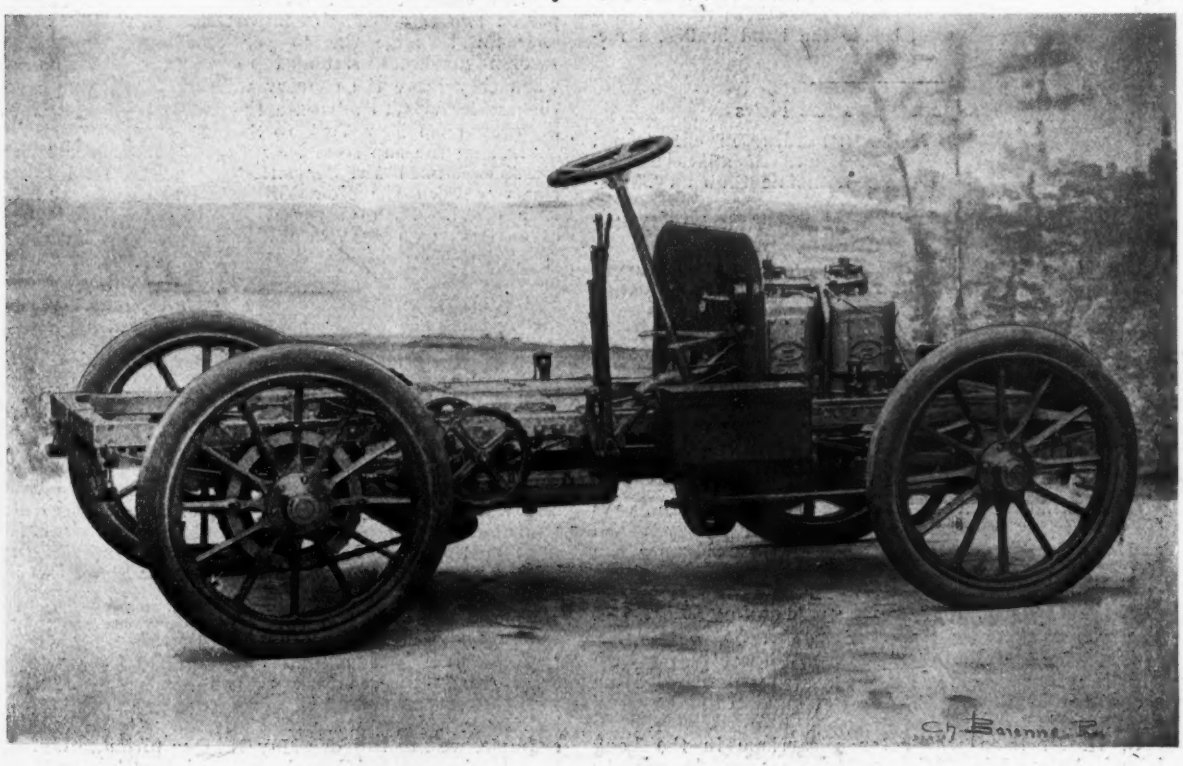
NEW YORK, March30.—Emile Voigt, of Paris, and C. R. Mabley, of New York, of the new Charron, Girardot & Voigt Co., of America, were at Rome, N. Y., last week and completed arrangements for building the company's American vehicles there.

"Let us impress on you," said Mr. Smith and Mr. Mabley to the MOTOR AGE man, "the fact that these cars will be reproductions in every particular of those turned out at our French factory. Engineers from our foreign factory are now installed at the Rome Locomotive Works superintending 200 workmen in turning out the vehicles. We expect to begin to make deliveries in July."

DENIES THAT TROUBLE EXISTS.

There was a surmise that there was trouble between the Panhard people and their selling agents at the bottom of the announcement made in MOTOR AGE of the formation of the American Panhard-Levassor Co. and the proposed erection of an American factory. Smith and Mabley, however, declared that the utmost friendliness existed between the two concerns and that M. Clement was a frequent caller at their office during his recent visit.

A statement, however, has been made by one who ought to know something of the inside story of these two factories, which has come to your correspondent's ears, that M. Clement's new move was only a bluff in opposition to the C. G. V. enterprise. Anyhow, relations have not been severed between the two; for the



THE FRAME OF THE CHARRON, GIRARDOT & VOIGT CARRIAGE, 1902 MODEL.

American selling agents still continue to receive large shipments of Panhards and to take orders for early deliveries of them.

WILL COST ABOUT $5,000.

The American machine, like its French prototype, will be built in one pattern frame and will be fitted with any style of overbody in vogue. The frame will weigh 1,700 pounds and the complete vehicle less than 2,000. The selling price of the frame will be $4,000, and with ordinary tonneau, phaeton or wagonette body, the cost will be from $5,000 to $5,500. Aluminum will enter largely into the construction of the completed vehicle.

BUILT AT ROME LOCOMOTIVE WORKS.

The automobiles will be built in the factories of the Rome Locomotive Works, which have been fully equipped for this purpose. For the manufacture of the American vehicles the Charron, Girardot & Voigt Co. of America, has been incorporated at Albany, with a capital of $500,000, $100,000 in preferred and $400,000 in common stock, all of which has been subscribed.

H. Monkhouse, of Rome, who is president of the locomotive company, is also president of the automobile company. A. Proctor Smith, of Yonkers, is the vice president, and C. R. Mabley, of New York, the secretary and treasurer. The business offices of the company will be located in New York.

POWER AND SPEED CAPACITY.

The frame will be equipped with a four cylinder gasoline motor of 15 horsepower, capable of a maximum speed of from 40 to 45 miles an hour. The cylinders are in one casting, without joints, thus preventing leakage. Hot water circulation around the carbureter maintains an even temperature of gas in cold weather. A single bolt controls the inlet and exhaust valves from the top.

The suspension of the rear frame is by three springs, one being a cross-spring, permitting transverse and longitudinal swing. There are four speeds with reverse, free wheel starting gear and, beside the hand brakes, a metallic foot brake.

New York News and Notes

New York, March 30.—A. R. Pardington entertained the members and guests with lantern slides at the smoker of the Long Island Automobile Club on Thursday evening.

Frank A. Egan, secretary of the American Motor League, is receiving application for membership daily, although he awaits the return of Vice-President Duryea from the west before sending out application blanks and beginning an active recruiting campaign. Dealers are to be asked to hang application blanks in their shops and manufacturers to print copies of them in their catalogues.

The De Dion-Bouton company, it is reported on good authority, will resume operations on April 1. For the present it will fill its orders with machines to be imported complete and now en route. They are mainly of the 9 and 15 horsepower classes.

Mr. Rianhard, of the Overman Automobile Co., says he expects to have one of the company's new model steam carriages ready for the A. C. A. endurance run on May 30. It will weigh about 3,000 pounds with gasoline and water tanks filled. These tanks will be of large capacity, that for water holding 80 gallons. The engine is to be of 14 horsepower.

James I. Blair, who was arrested recently for high speeding, has asked and been granted an investigating committee of the A. C. A. The magistrate, he says, would listen to no defense.

O. H. Martisen will enter a carriage in the Long Island Automobile Club's endurance run. It will be fitted with the much-talked-of construction of the Wheel Within Wheel Co., that is designed to enable a carriage to be shod with solid tires and yet offer ease of riding of pneumatics.

Two carloads of Oldsmobiles were welcome arrivals last week to Manager Owen. That other Manager Owen, of the Winton branch, has twenty-four touring cars en route to appease customers.

In view of the fact that the Long Island Automobile Club is arranging for exchange of privileges with suburban clubs, it is likely that the New York organization will emulate the example of the club across the river. There are innumerable suburban clubs within 20 or 30 miles of New York that would doubtless be willing to make a reciprocal agreement.

Automobilists will receive ample accommodations at Manhattan Beach. A big space under the bicycle track grandstand will be set aside for the storage of carriages, and a charge of 25 cents will be made.

S. M. Butler, secretary of the Automobile Club of America, has been selected as the delegate of the club to attend the interstate good roads convention at Charlotteville, Va., next month, when the Jefferson Memorial road to run from Charlotteville to Monticello will be inaugurated.

Road From New York to 'Frisco

President Scarritt, of the American Automobile Association, while in Buffalo last week, expressed the hope that some day, partly through the efforts of the association, there would be a national highway from one end of the continent to the other.

"The purpose of the American Automobile Association," he said, "is to bring together all of the clubs in the country, to endeavor to obtain good roads legislation everywhere in the United States, to protect the rights of automobilists on highways and to endeavor to encourage the sport and industry in every way possible.

"Our association, at its recent meeting in Chicago, passed two resolutions of importance. The first was to endeavor to have the 45 per cent duty imposed on foreign machines refunded to visiting automobilists when they leave the country with their machines; and the second was to advocate the building of a national highway from New York to San Francisco.

"During the run from New York to Buffalo last summer," continued Mr. Scarritt, "the wagon road lay at times between the New York Central tracks and the Erie canal. Both of these are magnificent specimens of engineering on which millions of dollars have been spent, but the public highway was full of ruts and often covered with water and mud, and was a disgrace to civilization. That condition of affairs is all wrong. We are not against the canal or the railroads, but we are in favor of better roads."

George H. Day a Chicago Visitor

Among the MOTOR AGE's visitors last week was George H. Day, president of the Electic Vehicle Co. To those who saw him just before his southern trip last year his altered appearance is simply wonderful. Work and worry such as fall to the lot of few business men had brought him to a shadow of the former vice-president of the Pope Mfg. Co., and he now admits that when he left for the south it was with an almost settled conviction that his retirement would be permanent. When he arrived in Chicago last week, "to look over the ground," as he declared, the old color and energy had returned and at least 10 years has been taken away from the careworn appearance of a year ago.

"I just came on to talk over a number of matters of business with our new manager, Henry Goodman. For example, we are to move May 1. Our ultimate destination is the automobile colony at Sixteenth street, but until the place is ready we shall have to seek temporary quarters."

Asked as to the exact location, Mr. Day said it was directly across the street from the present stores, in a building to be erected especially for the purpose.

"I seem to have arrived on the opening day of spring," continued the speaker. "The store has been full all morning and we have decided that it will be necessary to put on an additional man at once. We are well satisfied with the progress of events, in view of the set-back electrics have had in Chicago. All that will be overcome now that we are ready to demonstrate the quality of our vehicles on the spot. We are going in for a supply of information about charging stations and other things for the convenience of customers as we have in the east.

"Gasolines? Yes; we shall have some to offer soon. Just as soon as we are quite sure everything is right. My impression of the gasoline business is that some of the makers have started at the wrong end. You remember that in the bicycle business we started at the top price and came gradually down, as experience and improved facilities permitted. Some of the automobile makers seem to be making the cheap machines first. They will sell a lot of them, of course, but in the end I believe higher prices will prevail and that the public will realize the wisdom of paying a better price for better machines.

"Our affairs at Hartford are getting into splendid shape. I am glad to have around me a great many of the old bicycle hands. You can see them everywhere—in the office, superintendents, foremen, workmen and at the head of nearly every department. A few days ago Colonel Pope walked through the factory with me and when we got back to the office the one thing that seemed to impress him more than any other was the fact that he recognized so many men as old employes of the Pope company. And he was glad to see them doing well and comfortably situated.

"Our eastern business has been satisfactory. Even in Hartford a day rarely passes without at least one local sale. With improved vehicles, more charging stations and better facilities all around, we expect western business to improve remarkably this season."

Locomobile Company's Plant Attached

An attachment for $15,000 was made on the Locomobile Co. of America in Bridgeport, on March 27, in an action in which the American Bridge Co. is plaintiff. It is alleged in the complaint that the defendant has refused to pay commission amounting to $10,233.65 on building plans and specifications which were prepared by the Berlin Bridge & Iron Co., which was succeeded by the American Bridge Co. In an interview, President Davis, of the Locomobile company, said the plans as ordered were for a building which would cost 75 cents per foot floor space, and that when they were delivered it was found that the cost was estimated at $1.50 per foot.

Minneapolis has the Fever

Minneapolis, March 28.—One hundred and fifty Olds machines have been purchased by A. F. Chase & Co. for sale in this city, and a majority of them have already been taken. The firm believes it can sell 200 before the season closes. Among the people who have already new automobiles this spring are Wl. A. Clark, E. J. Phelps, Charles E. Force, Dr. C. D. Harrington, George C. Christian, R. M. Stoddard, Willis Walker, A. C. Loring, W. H. Wheeler, Fred Kees, George W. Brown, C. E. Purdy, Charles F. Stremel and J. J. Barclay.

United States Consul Davidson, of Japan, reports that a dozen Japanese women of Tokio have organized a bicycle club. Surprise has been general, because heretofore it has been felt that cycling was an unladylike sport. The Japanese press, however, advocates the use of the bicycle by both sexes.

SALESROOM AT SMITH & MABLEY'S ESTABLISHMENT.

WILL NOT PERMIT DISCRIMINATION

Washington Club Tells Commissioners That Rules Are All Right But Must Apply to All Vehicles

CHARLES E. FOSTER appeared before the district commissioners at Washington, as the representative of the National Capital Automobile Club, last week, to discuss with them certain regulations which the commissioners desired to adopt. Mr. Foster said that the club was in hearty accord with most of the rules. For example, he said, it was proper and necessary that there should be a speed limit, and the club thought it was well to have some means of identifying the operator of any machine. Repairing lights at nights was also wise, and no one objected to paying a reasonable license.

DISCRIMINATION ALLEGED.

Mr. Foster said that the club did strenuously oppose the regulations applied to motor vehicles and to no others. They denied the right of the commissioners to single out one class.

Mr. Foster called attention to frequent accidents resulting from the fast or improper driving of horses and vehicles. He cited the case of a man who was killed a short time ago on Pennsylvania avenue, and because there was no means of identifying the driver it was not known to the authorities to this day who was responsible for the tragedy. In short the club did not object to the regulations *per se*, but wanted them to include every class of vehicle. Mr. Foster said that a single exception might be allowed in the case of a man driving a horse and wagon by which he earns his living. This, he thought, might be exempted from a license but not from registry.

LEGAL ADVICE TAKEN.

Mr. Foster stated that the club had taken legal advice in the matter, and that he had been instructed to announce that in their opinion the regulations as they stand applying alone to mechanical vehicles would not stand before the courts. He thought the courts would take the ground that the law was one of discrimination against a class of vehicles, and would on that account cause it to be revoked.

Preparations for the Paris-Vienna

As an indication of the interest taken in Europe in the coming Paris-Vienna race it may be stated that Austria alone has made five entries to date. Among them is the firm of Jacob Lohner & Co., which is preparing three vehicles of mixed power, probably gasoline and electricity. Another, named Nesseldorf, is making, in a private room in his factory, a machine which he claims will average about 75 miles an hour for the whole journey. Others are the Austrian Daimler company, which is working day and night to get its entries ready. The latest additions to the list are Boch & Hollender and the Motor Cycle Co. of the Republic. The first named is one of the oldest makers of light vehicles and will enter one very similar to the Panhard. It will have two vertical cylinders of 12 horsepower each and will not weigh over 1,450 pounds.

The Governor Signs Speed Bill

Albany, N. Y., March 28.—Limit to the speed of automobiles was fixed in the Cocks bill, which was signed by Governor Odell today. The measure has been one of the most interesting of the session.

The Automobile Club of America is responsible for the changes in the measure, which, as originally introduced, authorized justices of the peace to try and heavily fine those who violated the law. The bill as signed is as follows:

A person who drives or operates an automobile or motor vehicle, whether the motive power of the same be electricity, steam, gasoline or other source of energy, upon any plank road, turnpike or public highway within any city or incorporated village, at a greater rate of speed than 8 miles per hour except where a greater rate of speed is permitted by the ordinance of a city, or upon any plank road, turnpike or public highway outside of a city or incorporated village at a greater rate of speed than 20 miles per hour, or upon any bridge at a greater rate of speed than 4 miles per hour, is guilty of misdemeanor, and shall be fined for the first offense not exceeding the sum of $50, and for the second offense not exceeding $50, or by imprisonment for a term not exceeding six months, or both.

Cost of Operation of Automobiles

According to the New York Sun an eastern operator who owns a 16-horsepower American made machine, with a seating capacity of six, has made a 30-days' test of the cost of operation. He drove 700 miles, kept the machine in one place and attended to it himself, except as to the rough cleaning work done by the men at the storage station. Following is the table of the expenses:

Jan. 31—6 gals. gasoline	$ 1.20
Feb. 1—3 gals. gasoline	.60
Feb. 2—3½ gals. gasoline	.70
1 gal. cyl. oil	.75
Feb. 3—20 lbs. glycerine	4.00
Feb. 4—5 gals. gasoline	1.00
Feb. 5—2½ gals. gasoline	.50
Feb. 6—1½ gals. gasoline	.30
Feb. 7—5 gals. gasoline	1.00
Feb. 8—4 gals. gasoline	.80
Feb. 9—2½ gals. gasoline	.50
Feb. 13—5 gals. gasoline	1.00
Feb. 16—8½ gals. gasoline	1.70
Feb. 17—4 gals. gasoline	.80
½ gal. cyl. oil	1.40
Feb. 19—5 gals. gasoline	1.00
Feb. 22—2 gals. gasoline	.40
Three days' storage in January	2.00
Feb. 28—One month's storage	20.00
Total	$38.65

This shows that the cost of fuel amounted to about 1¼ cents for every mile traveled.

Tip for Speed-Guessing Policemen

An event from which many a policeman who prides himself on his ability to judge the speed of automobiles may take a lesson occurred last week near Paterson, N. J. The New Jersey Automobile Club held a speed guessing contest. Each machine entered ran a distance of two blocks, the spectators guessing how many miles an hour they traveled. There was no guess which came within 6 miles of the actual speed of any carriage and many guesses were as much as 12 miles out of the way. An important fact is that no guesses underestimated the speed. This information may be worth preserving as an evidence of the manner in which speed is exaggerated.

Mile Straightaway on Staten Island

New York, March 30.—The probabilities favor Staten Island for the mile straightaway tracks of the A. C. A. on May 31. A. C. Bostwick, chairman of the race committee, and S. M. Butler, secretary of the club, went over the course with the club engineer, last week, and decided to include the course viewed among those over which permission to run will be asked.

Paris-Vienna Races Not Abandoned

New York, March 30.—It would seem from the latest news by cable that, after all, Mr. Bostwick's information as transmitted to the MOTOR AGE man about the Paris-

Vienna race was incorrect. A private cable to M. Cuenod, a member of the race committee, on Tuesday, confirmed Mr. Bostwick's story and it was so announced by him at the A. C. A. meeting that evening. A cable to the Herald on Thursday, however, declared that Mr. Bostwick's fears were unfounded. The next day M. Cuenod also announced that he had received an official cable stating that the race was still on.

The Auto-Bus in London

The London bus driver regards himself as an indispensable fixture in metropolitan life. He was probably born the son and grandson of bus drivers and his pride is pardonable. The reception of the first operator of a steam bus can therefore be better imagined than described. But the trial has been made and will be made regularly hereafter and it is even said that some of the more thoughtful of the men who drive London's public are seeking to attain sufficient knowledge of the new-fangled thing to enable them to take positions if the worst comes to the worst—as it surely will.

The steam bus, odorless, noiseless and smokeless, has been placed in operation by the London Road Car Co. A dozen passengers can ride inside and twice that number on top. An awning is provided, something not attempted in the old style vehicles. There is also a side curtain to keep out wind and rain. The company will give the vehicle a thorough trial before making any assertions as to economy of operation, but will add others as soon as the first shall have demonstrated its operating capacity sufficiently. It cannot be said to compare favorably, in the matter of appearance, with some American productions, that of the Chicago Motor Vehicle Co., for example, but the cost of gasoline in England makes it practically prohibitive and renders it necessary to provide space for coal or coke, water and a large boiler, thereby rendering the trim appearance of the gasoline car impossible.

To Manage Races at Philadelphia

Philadelphia, March 30.—C. Ross Klosterman, manager of the Philadelphia, Baltimore and Washington cycle tracks, has been invited by the Automobile Club of Philadelphia to manage its race meet proposed to be run in May at the Belmont Driving Park or the Point Breeze track. The latter, however, is the more favored. Three classes for gasoline vehicles and one each for steamers and electric are proposed.

The Three A's Will Meet

New York, March 30.—The directors of the American Automobile Association will hold their first monthly meeting at the A. C. A. club rooms on Tuesday. President Scarritt has asked each director to outline in writing his suggestions as to the work to be done and the committees to be appointed.

Dues of the Automobile Association

Frederick H. Elliott, of the Syracuse club, says that the members object strenuously to the membership fee asked for by the American Automobile Association, and says that if $3 per member is required he is quite sure the club will not join. If the clubs generally were to take that position they might just as well have acknowledged, in the first place, their willingness to be ruled by the New York club and to allow that organization to bear all the expense from which they will benefit.

It seems hardly possible that clubs representing so good a class of men as automobilists generally can take such a stand, and this remark applies particularly to clubs in the east, where, for a time at least, the efforts of the association and of the Automobile Club of America will be productive of best results.

The Automobile Club of America has, without asking assistance from others, expended its money and its energy liberally in the promotion of the best interests of automobilism. Is it possible that Syracuse will object to paying a reasonable share of the expense of such work which must, in the natural order of things, be undertaken to a very large etxent hereafter by the American Automobile Association?

In Chicago, and the west generally, it will be impossible for the influence of the association to be felt to as great an extent as in the east for a long time, yet the Chicago club seized the first opportunity to instruct its officers to file a formal application for membership and to pay the dues for all its members. It was probably the first club to do so. Is not the example worthy of emulation by other clubs and especially by those which will receive the greatest share of benefit from the association's work?

These Will Enter the Test

New York, March 30.—Coming first, as it does, the 100-mile endurance run of the Long Island Automobile Club is receiving the greater attention at present. Manufacturers are much interested in it and are entering in many cases four or five vehicles each. Among the entries already received or promised are Panhard, Durracq, C. G. V., De Dion, Gasmobile, Haynes-Apperson, Apperson Bros., Toledo, White, Prescott and Overman vehicles.

London's Auto Bus.

Afraid of Their Easter Clothes

New York, March 30.—Owing to rain the opening club runs of the season had to be postponed. The A. C. A. was to have gone to Ardsley and will probably do so next Saturday. The L. I. A. C. had a dinner on hand at Woodmore and had given up the regular Sunday run on account of Easter.

Syracuse Club Enters a Protest

New York, March 30.—A delegate from the Syracuse Automobile Club has visited President Scarritt, of the American Automobile Association, and protested against the dues of three dollars per member as being too high.

CULTURED BOSTONIANS CRAVE TONNEAUS

One Man Ready to Pay Big Bonus—Skinner Imports New De Dions—Pierce and St. Louis Carriages Popular—Preparing for Springfield

BOSTON, March 31.—An incident illustrating the popularity of the tonneau and the condition of trade in the vicinity occurred a few days ago at the branch of the Winton Motor Carriage Co., on Stanhope street, while a MOTOR AGE representative was calling on Harry Fosdick, the local manager. A chauffeur employed by a well-known Boston man entered the establishment and approaching Fosdick, to whom he was known, said:

"Mr. Fosdick, I've got a man that wants to buy a good machine with a tonneau body and he wants it right away. Can he get one of the new Winton touring cars?"

BONUS OF ONE THOUSAND DOLLARS.

"No sir," replied Fosdick. "I have customers waiting for all the cars I can get for the next six weeks. I would like to take his order, but all the wagons I have coming for the next month or so are sold."

"Well, if he pays a bonus in addition to the regular price can't he get one of the cars coming? He doesn't care so much about the price, but he won't wait."

"No sirree. We don't do business in that manner. We fill our orders in the order they are received and will not make any exceptions. Why we have people going to the factory every day who think they can get a car without awaiting their turn."

"Well, this man wants a Winton and won't wait."

"If he wants to pay $1,000 extra I think I know a man who will sell. He has a carriage coming next week and might be induced to sell if he can make $1,000 by so doing."

"All right. I'll bring my man in tomorrow and you have the purchaser here and they can get together and make the deal."

"Very well," but, "continued Fosdick, "I don't know, mind you, that he will sell. The opportunity of making $1,000 quick may interest him."

Turning to the MOTOR AGE man, Fosdick said: "I have opportunities every day to make big money by selling a carriage to anxious people who don't want to wait their turn, but my firm wouldn't stand for it. We are filling our orders in the turn they were received and if any money is to be made by selling options we give our customers the benefit of it."

SKINNER RECEIVES NEW DE DION.

The demand for tonneaus in this city is remarkable and there are only two concerns, up to date, that have sample machines to show, Winton and Kenneth Skinner. The latter has just received a most attractive 8-horsepower De Dion tonneau from France, and which he has placed on the American market. He has eight of them coming over to fill orders and intends hereafter assembling here, importing the engines and running gear and building the bodies in this country, thus saving considerable duty. An attractive feature of the new De Dion is the tonneau. This swells out at the side of the vehicle and enables the passengers to have a clear view ahead unobstructed by those occupying the front seats. Skinner will take this vehicle to the Washington show next week.

POPULAR HOME-MADE MACHINES.

Mr. Lewis, of the Automobile Exchange, is enthusiastic over the conditions of the business. He is enjoying a particular big demand for the Pierce and St. Louis carriages. He said:

"Boston is getting to be a big town for automobiles. Why back in January, when the streets were thick with snow, we were averaging over one wagon a day and since the fair weather has set in we are having all we can attend to."

With the big accommodations he has for storage Lewis makes money at both ends of the line. Every wagon he sells is left with him for storage, and thus proves a source of income.

AUTOCAR IS GOOD FOR THE NERVES.

"I want to show you what an easy riding carriage the Autocar is. Jump in," said R. Ross, of H. B. Shattuck & Son, on seeing the MOTOR AGE man. Mr. Ross keeps an Autocar standing outside the establishment for demonstration, and the reporter, who has ridden in nearly every vehicle made in this country, can testify to its easy riding and easy control. Those who think the gasoline carriage is a noisy and nerve-racking machine would change their minds after riding in an Autocar. It is no exaggeration to say that one hardly feels more vibration than in some of the steam carriages. The energetic and unostentatious work of the Ardmore company has placed its vehicle among the leading American productions.

A number of Boston chauffeurs, who have faith in the speed of their machines will enter the races of the Springfield Automobile Club on May 30. Kenneth Skinner has also entered both the Long Island and the A. C. A.'s endurance contests.

Among the Cleveland Dealers

Cleveland, O., April 2.—A new concern which is making a good record for itself is the Price Brothers' Carriage Co., with a line consisting of the Baker electric, Peerless, Elmore, Darling gasoline and Toledo steam. With the exception of the Baker, all are new in Cleveland, but the concern has already disposed of about forty-five vehicles and has orders for more. The company is equipping a large repair shop and will take care of all kinds of machines.

The Oldsmobile company, state representative of the Olds, is maintaining a record breaking pace. Two machines per day is now the pace. Thanks to the remarkable capacity of the Detroit plant, the company is able to keep somewhere near the bottom of the order pile. It is expected that when warm weather sets in for good the machines will be going out at the rate of three per day, and Manager Owen has arranged for larger and more prompt shipments. A few days ago a contract was closed with Avery & Davis, of Columbus, and an initial order for thirty vehicles was placed.

R. R. Darling, an old timer in the business, formerly with Beardsley & Hubbs, has opened a repair and experimental shop in this city. He is building an experimental machine embodying original features, and claims to have interested capital with a view of starting a factory.

Baker Brothers, of Tiffin, O., are in correspondence with the city officials with a view to operating vehicles in the Cleveland parks and boulevards. Some time ago the city advertised for proposals for the service, but received no bids. The Tiffin people have a large automobile bus and say if they can secure a suitable grant they will make a contract to build and operate several machines.

The Cleveland Automobile and Supply Co. has sold a $12,000 Panhard to a local enthusiast. This makes the third of this type sold in this city.

Charles W. Mears, formerly editor of the Motor Review and more recently editor of a Cleveland financial paper, has become sporting editor of The Press, a leading afternoon daily.

Banker brothers, of Pittsburg, will soon invade New York. They have arranged for the eerction of a new storage, show and sales building in 38th street.

BETWEEN NEW YORK AND BOSTON

Motor Age's Suggestion Adopted for This Year's Endurance Run—Many Improvements Over Last Year's Arrangements

NEW YORK, March 30.—The Automobile Club of America had its last club night of the season on Sunday. The members had been asked to make suggestions as to both the coming endurance runs—the 100-mile test on May 30, and the long distance run in the autumn. Discussion was confined mainly to the latter and founded on President Shattuck's announcement that the committee had practically decided in favor of the route to Boston and return—a 6 days' run.

This was the suggestion made in MOTOR AGE following the Buffalo run. The advantages of the New York-Boston course, in the way of publicity, convenience and supply facilities were then pointed out and have evidently not been forgotten.

KEEP OUT OF THE WET.

"We'll never run to Buffalo again," said Mr. Shattuck, "until the state builds a boulevard." The date was not discussed, but President Shattuck suggested, with a reminiscent smile, that the run should not be held during the equinoctial storm.

The question of official observers was first taken up. Mr. Scarritt declared he had very decided opinions on this subject. He had made inquiries at the Chicago show to get criticisms of the last run. The chief criticism had been that no official record had been kept of the behavior of each carriage. Last year they had feared to make too many restrictions. He thought there should be a complete record kept.

OFFICIAL OBSERVERS AND NO REPAIR WAGONS.

This year there should be a harder test and a stricter test. The contestants should carry all extra parts, and parts should be replaced in no other way. There should be no machine shops sent ahead by express and only local blacksmiths should be employed. Mr. Shattuck said it was the committee's idea to have students from Columbia or Stevens go along to act as observers. The general opinion was that there should certainly be such officials, who should keep a complete record.

In the matter of repairs the president told how in the Paris-Berlin race the manufacturers sent repair men ahead. This year, however, in the Paris-Vienna rules, it was provided that the vehicles should be locked up in an inclosure over night and that all time taken for repairs should be added to racing time.

The result of the discussion seemed to be that contestants should not be limited as to the kind or quantity of parts they carried on their vehicles. It was the general opinion that no attempt should be made to limit gasoline consumption in the long run, though the observers should keep a record of the consumption, as this was getting to be an important factor in judging the merits of a vehicle.

LAW AND ANGLO-SAXON SPIRIT.

Racing on the run received due attention. The president said the club stood for law, and Mr. Scarritt backed him up. Various problems, as to a man racing to catch up, or increasing his speed in furtherance of the Anglo-Saxon disinclination to take another man's dust or move aside to let another pass, were discussed. Some wanted offenders disqualified. Others thought every man should look out for himself and take the risk of violating local speed laws at his peril. No final conclusion was reached.

NON-STOP IDEA DOESN'T PLEASE STEAM MEN.

Tire punctures will probably not be penalized, though a record will be kept of them. Mr. Rianhard wanted the noon-day controls abandoned. Mr. Shattuck reminded him that arrangements had to be made for food supply for so large a number. The president also said it had been suggested that the run be a non-stop contest each day. This would simplify matters. "What about the steam people?" asked Mr. Ricker. The non-stop proposition was not received with favor.

CUENOD WANTS LONG TEST.

M. Cuenod thought the endurance-run idea was a good one, but that the test should be for 5,000 instead of for 500 or 1,000 miles. He believed the shorter run gave too much chance for good and bad luck. He raised quite a laugh by declaring the only way to insure observance of the repair rules was to chain the operator and give him only enough length of chain to permit him to stand by the step of his vehicle on one side.

HAS EDISON JR. DISCOVERED PERPETUAL MOTION?

While the world awaits, with impatience, further information relative to the Edison battery, which, according to its boomers, is to revolutionize the automobile industry, there comes from the south a story of an invention by W. Leslie Edison, son of the famous inventor, and Professor Fessenden, now with the government's experimental forces.

"While passing my time here at Manteo, N. C., for the shore bird shooting," writes a MOTOR AGE subscriber, "it has been my good fortune to see a device which I believe will push electrical machines to the front. Being an automobile crank, I want to give you as much of an idea as I feel I am permitted to do, for I am sure many friends, as well as myself, will be glad to hear of the coming of the device.

RECHARGES BATTERIES—BUT HOW?

"The device referred to is carried on the vehicle and recharges the batteries while the machine is in motion or at a standstill. When the battery becomes sufficiently exhausted it is started automatically. It can be started by the operator, who need not leave the seat, and it will also 'see you home' even though the batteries may be broken down. Thus you see an electrical machine has an unlimited radius.

"Speaking about the machine Mr. Edison says:

CALLS IT A LIFE SAVER.

"'I believe we have a life saver for electric machines. This arrangement can be attached to any part of the vehicle at the wish of the owner; will give an unlimited radius; works automatically; weighs but 50 pounds; will pump up the tires besides, and, taken all in all, besides being very compact, is just what is wanted.'

"I am very sorry I cannot give details, but the inventors are about to apply for patents, etc., and it would be treading on my privileges to go any further.

LIGHT A HOUSE AND DO THE CHORES.

"Mr. Edison also states that this machine can be put in a stable for a charging plant and can be used to light a house, pump water and many other devices. He states that it can recharge a storage battery of 6 horsepower capacity for 32 cents, with the same proportion to other batteries. He is now at work on one for me."

MOTOR BICYCLES DESIGNED BY PIONEERS

ENGLAND now has a paper called Motor Cycling, the first publication of its class in the world. It is published by Edmund Dangerfield, who has for many years been prominent in cycling journalism. Among the articles in its first issue is one on motor cycle history which shows that vehicles of this class engaged the attention of inventors as early as 1781.

At the French exhibition, in 1878, says the writer, there was a steam motor bicycle of which I give a rough drawing, Fig. 2, from memory. The wheels were of hickory with iron tires. The boiler, according to my impression, was too small for a ride longer than 100 yards. The engine drove direct to a pair of cranks attached to a small rear wheel.

INVENTED BY WATT'S FOREMAN.

But a century previous to this masterpiece (1781), Murdock, Watt's foreman, had designed a small road carriage whose rear wheels were 20 inches and the front wheels 9 inches in diameter and whose dimensions, over all, were between 3 and 4 feet. On one of its trials it ran away from the inventor and continued at 12 miles an hour until it ran into a pond. Murdock was finally persuaded by Watt to abandon his machine.

PRIMITIVE DRAFTING AND ITS DANGERS.

Apropos of Watt, a warning to inventors. When he first designed his engine and its piston and mechanism for transforming rectilinear into circular motion by means of the crank, being much elated with his success, walked to the village inn and there proceeded to explain his idea by dipping his finger in his mug of beer and tracing an outline of his invention. A gentleman from London, named James Picard, recognized the value of the invention and applied for a patent before Watt had a chance. This same person actually sued Watt for infringement, but the latter designed the sun and planet motion and evaded the imposition.

DAIMLER AND DE DION'S PRODUCTIONS.

In 1885 Otto Daimler made his famous motor bicycle. The object was not so much to supply a practical vehicle as to provide reliable data for other carriages.

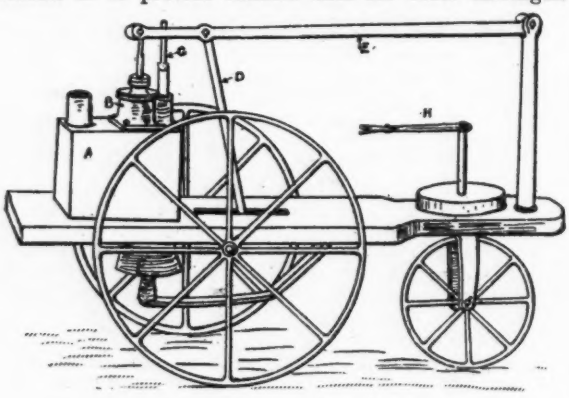


FIG. I. MURDOCK'S MOTOR CYCLE 1781.

This machine (Fig. 4) of Daimler had a most important effect, however, as De Dion had experimented with steam with such disappointing results that he abandoned hope of success, but finally in 1895, or thereabout, he practically took Daimler's engine and attached it to the back of a tricycle. There was a great resemblance between it and a sectional drawing of De Dion's motor, even down to the valve arrangements and the enclosed flywheels, the only difference being that De Dion's engine was entirely air-cooled. However, this was a huge step in advance, for in the Paris-Toulouse race in 1897, and many others, the tricycles easily beat the cars of that period. De Dion also constructed a motor bicycle about this time. He placed his tricycle engine

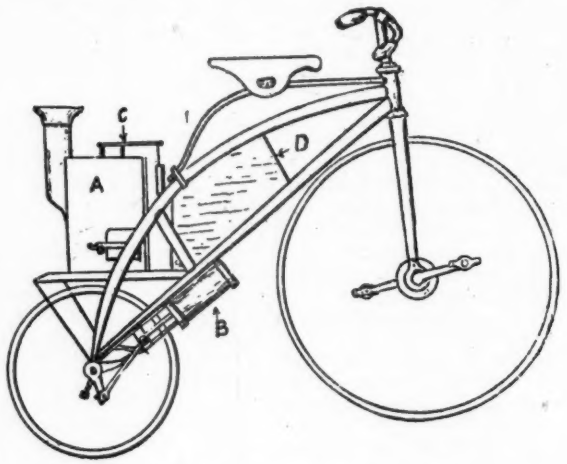


Fig. 2. Motor Bicycle Shown at Paris, 1878.

just behind the bottom bracket and drove from engine to back wheel by a train of pinions.

AN EXCITING RIDE AND A TUMBLE.

Contemporary with De Dion's invention was the Hildebrand-Wolffmuller bicycle, shown in Fig. 5. This was in 1895. It reached 27 miles an hour, but its great fault was its slipping and inability to climb hills.

I made its acquaintance in 1897, while on a visit to the continent. Being placed carefully in the saddle, and having got the control by means of the throttle and mixture, I went off in grand form at about 20 miles an hour.

I felt very imposing indeed, but suddenly became aware that there was a crossing some 10 yards in front, and a large railway van just turning the corner. There was little time for reflection. In a second I realized that I could not get through, and in less time than it takes to relate pictured myself under the wheels of that van. My impulse was to swing the front wheel at right angles to the frame with the result that the machine came down about 4 feet from the van.

DANGER FROM TUBE IGNITION.

I saw my friend rushing up the road, shouting "Put out the lamps! Put out the lamps!" As the machine was fitted with the tube ignition, the danger can be understood. However, nothing happened in the way of an illumination, and I considered that I had got off cheaply with a cut knee and damaged hand. These I dressed with gasoline—a useful tip in such cases. The machine was uninjured.

THE WOLFFMULLER BICYCLE.

Apropos of the Wolffmuller bicycle, it is well to mention that this was perhaps the first practical motor-

bicycle. The engine was water-cooled. The gear for valves was actuated by a small ball-bearing eccentric placed on the back axle. Large rubber straps were attached to the big end of the connecting rod and cylinder to assist in overcoming the compression. As the outward stroke of the piston extended these, they, in returning, on the inward stroke exerted considerable force. A marked peculiarity of this machine was a funny tapping sound made by the carbureter. This was due to two little non-return valves which served as air inlets. I have often wondered that this small feature has not been copied, for anybody who has placed his hand to the air intake of a carbureter when the engine is running will have felt the force of the "blow back," and will be able to appreciate the economy which such an arrangement, if efficient, will bring about.

AN EARLY MOTOR TANDEM.

Wolffmuller also constructed a tandem with four cylinders, but it was not a success, chiefly owing to ignition troubles. This machine was first fitted with the electrical ignition, but their system being faulty, lamps and tubes were substituted. These gave endless trouble, blowing out, going out, flaring, irregularly firing, etc., until, in 1895, I believe, Dr. Ganz, of Frankfurt, brought out his improved pressure-fed burner.

SHOULD HAVE WON GORDON BENNETT RACE.

In 1897, Dr. Ganz employed an engineer named Baur to ride his Wolffmuller, so fitted in the Paris-Dieppe race (the first Gordon Bennett). He competed, and would, in my opinion, have won, for the road suited the now vastly improved machine admirably, but Baur had forgotten to close the drain tap of the water tank before starting, and only became aware that something was wrong when his engine was nearly red hot. Not being able to speak a word of French, he had much trouble in explaining his wants to the peasants.

SALAD OIL AS A LUBRICANT.

At length he obtained water and resumed his journey.

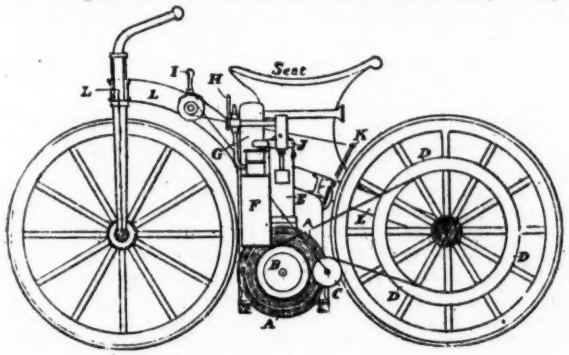


Fig. 4. Daimler, 1885.

Presently ominous sounds from the engine betokened more trouble. Dismounting he found it once more almost red hot and the tank again empty. At this juncture he thought of looking at the drain cock, which he found wide open. A horse pond being handy, he filled up and started again, and all seemed right. But not for long. His engine began to lose power, and upon examining his lubricators he found them empty. He had used the lubricant too lavishly on the cylinders before finding the true cause of the trouble. Managing to obtain some salad oil, he essayed to continue. Salad oil did not prove a very good lubricating medium, and owing to continual back firing Baur eventually abandoned the contest at Amiens.

RIVAL MACHINE WAS A FAILURE.

Another machine (see Fig. 6), I might say an attempt to rival the Wolffmuller, appeared during 1896, made by Heigel-Weguelin, also a Munich firm. This machine was fitted with one large air-cooled cylinder, which occupied the position of the down tube from the head to the bracket, and drove a bevel gear therein which was continued to the back hub. The cylinder was 4 in. bore and with a 4 in. stroke, and was furnished with magneto-dynamic ignition. This cylinder, which I have still, is another interesting relic. This last-mentioned machine never achieved great notoriety, although one was to be seen about the streets of London a year or two ago. In common with the Wolffmuller machine it was a bad hill climber.

Stone Makes an Auto-Bi Fly

Stone and Judge, who are doing the cycle whirl under Tom Eck's management, recently made some splendid time trials on the Tonawanda boulevard, near Buffalo.

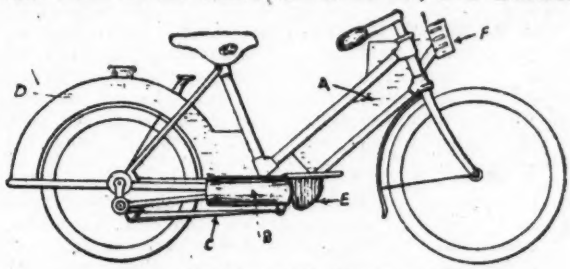


Fig. 5. Hildebrand-Wolffmuller, 1895.

They were accompanied by Lottie Brandon. A local reporter says that Stone handled his machine in splendid style. He got all the speed he could out of the Auto-Bi, which carried him over the bricks at terrific speed. There was a wind blowing down the boulevard, but it did not have any effect on Stone's appearance. He covered mile after mile at express-train speed. The unofficial time averaged about 1.20 for the mile straightway.

Delivery of Winton Carriages

Writing from Cleveland, under date of March 27, Charles B. Shanks, of the Winton company, says that a wrong impression is abroad to the effect that the company, on account of the large number of orders received for its touring car, will be unable to make deliveries on orders received now until quite late in the season. "It is true," he says, "that a large number of orders for the touring car were upon our books before we began to make regular deliveries, but now the facilities of our entire plant are concentrated upon the production of touring cars, and they are coming through the factory so smoothly and in such gratifying quantities that a large hole has already been made in the order list. In a

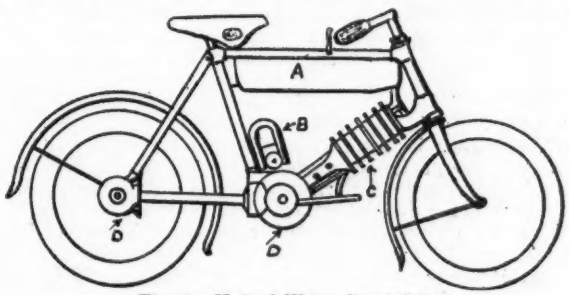


Fig. 6. Heigel-Weguelin, 1896.

short time we will be abreast of orders and in the case of orders booked at this time we are able to assure satisfactory delivery dates. Our time and energies are given to production. The experimenting was finished last year."

THE CONSTRUCTION OF A MAGNETO GENERATOR

By L. Elliott Brookes.

PART III.

The core of each of the pole pieces of the armature may be wound with No. 22 double covered cotton copper wire. This should be wound on each core until the thickness of the same, including the wire, is a trifle under ¾ in. over all. Care should be taken in winding to start from the inner end of each core; that is, at the point nearest to the armature shaft, and to allow the starting end of the wire on each core to project through between the cores on the commutator end of the armature about 2 or 3 in., so as to give plenty of room for making the connections to the commutator when ready to do so. An even number of layers of wire must be wound on each core so as to get the starting end at the end of the outer layer of the windings at the bottom of each core, to enable the commutator connections to be properly made.

On the first section of the armature the number of layers of wire on the core should be carefully counted as they are wound so as to get the same number on each of the succeeding cores. This is imperative. After

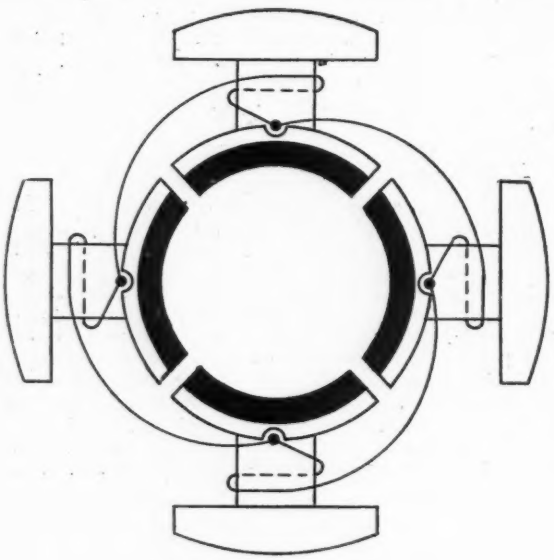


Fig. 11.

the armature is wound carefully shellac each coil, including the projecting ends, which are to be used for the commutator connections. When thoroughly dry scrape off the insulation on each of the 8 connection wires far enough back that they can be twisted together almost their entire length. Next take a very small soldering iron and a little soft solder, and solder each pair of wires their entire length where twisted together.

Now put the commutator on the shaft, being sure to have it a good driving fit. Then put the armature on the shaft also, and tighten up the two No. 10-24 screws in the same to firmly hold the armature in position. The length from the outside end of the commutator to the further end of the armature should be a trifle less than 4⅜ in., not including the two small brass friction washers shown in Fig. 9.

Some small rubber hose, which can be procured at any electrical supply house, is needed to slip over the twisted wires, which are to be then cut off to the proper length, and the rubber hose put on over them and their ends soldered to the commutator sections. Fig. 11 shows the proper position of the commutator with relation to the armature, and also the manner of making the connections from the armature spools to the commutator sections.

The field spools shown in Fig. 10 can now be made ready to wind with No. 18 double covered cotton wire to the depth of ⅜ in. from the bottom of the spool, making the total thickness through the spool, when wound, 1¼ in. After winding and securing the outer end of the wire with a small piece of sticky tape, so that it cannot work loose, carefully shellac the outside of the finished spools and allow to dry. Each of the connection wires from the field spools should be left to project about 6 in. each.

Care should be taken in winding both the armature sections and field coils that all windings be started from the same end of core or spool and all wound in the same direction, either right or left, as the case may be. It makes no difference in which direction they are wound so long as they are all wound alike.

The pole pieces shown in Fig. 3 can now be secured together by the top and bottom connecting plates after being carefully machined off on top and bottom as shown in the drawing. The outfit, as assembled, can then be fastened to an angle plate attached to the face plate of a lathe and bored to proper size, and finished on the ends.

The permanent magnets, which are made of ⅜ by ⅝ magnet steel, should be carefully annealed before bending into shape by heating to a cherry red, in the dark, and covering up in unslaked lime until thoroughly cooled. They should be bent a trifle closer than the width across the slots in the pole pieces so as to securely hold themselves in position on the pole pieces by having to be forced into their respective slots with considerable pressure. Before putting the magnets in place the field coils should be slipped on over the magnets. The armature can now be placed in the field ring and the pulley bearing end put on. The bursh rocker arm should next be put in place on the commutator end bearing, and the brush holders put in place with their respective insulating bushings and fiber washer, and secured therein by means of the round lock nuts shown in Fig. 6.

The commutator end bearing is now ready to attach to the field or pole pieces. Next connect one field coil to the other by fastening one of the inner connection wires to one of the outer ones; that is to say, connect one end of the wire from the inner layer or winding of one field coil to the wire from the outer layer or winding of the other field coil. The manner of connecting one of the outside connection wires from the field spools depends altogether upon the polarity of the permanent magnets and their location with regard to the pole pieces from the commutator side. First ascertain which are the north poles of the magnets by means of a small compass; then so make the connections from one of the brush holders to the outer connection wire of the field coil on the north pole, that,

supposing a current of electricity were flowing from the armature through the brush holder connection to the field spools, it would travel around the north pole of the magnet in the direction of the hands of a clock when looking down upon the generator from above. It makes no difference whether the current enters the coil at the bottom and passes around and emerges at the top, or enters the coil at the top and comes out at the bottom; it is the direction of travel or rotation of the path of the current which fixes the polarity of the ends of the coil.

In making the final connections of the generator it is to be remembered that the two field coils are to be connected in series as before described, and then one of the outside connections of the same connected to one of the brush holder connections, thus leaving one free end on the field spools and one free commutator connection. These will form the connecting points to the induction coil. If any doubt is felt about making the connections as described, the simplest way is to run the generator on a lathe, or by means of a belt from some source of power, and by changing the connection from the field spools to one brush holder or the other while the generator is running the proper connecting point can readily be ascertained. This generator should run from 1,000 to 1,500 revolutions per minute, and will give about 8 to 10 volts and 3 to 5 amperes.

Fig. 12 shows details of both friction roller and belt pulley for use on the generator shaft. The friction roller is 2 in. diameter and $\frac{7}{8}$ in. face. It is to be made of vulcanized fiber with brass hub and flanges. One flange is solid upon the hub, while the other is loose and screws upon the end of the hub which projects through the fiber roller. Before assembling the hole in the fiber roller and both sides of same should be well coated with thick shellac varnish. Screw the loose flange tightly in place and then drill on the thread line and drive a small pin in, half in hub and half in the loose flange, to prevent the flange from coming off.

The pulley is of cast iron, and a small pattern is required for same. A flat should be cut or filed upon the armature shaft to receive the point of the set screw which is located in the hub of roller or pulley. The friction roller is made somewhat smaller than the belt pulley on account of its greater tendency to slip. The belt pulley is for $\frac{3}{4}$-in. wide belt. The friction roller or pulley should be so located on the driving end of the armature shaft that the long or projecting hub which carries the set screw is furthest away from the bearing. The object of this is to bring the friction roller or pulley as close to the bearing as possible and relieve the bearing from all unnecessary strain.

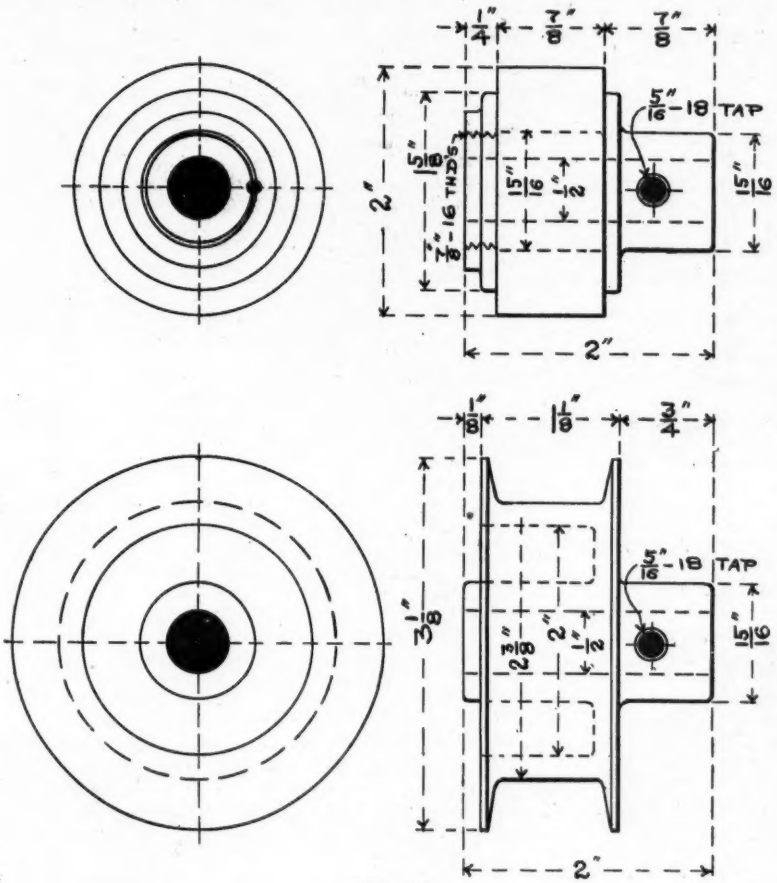


Fig. 12.

The Mossler Engine

The Mosler valveless engine, manufactured by Arthur R. Mosler, 309 Broadway, New York, is something of a novelty in automobile construction, being one of few engines of the two cycle type used in self-propelled vehicles. It is of the two cylinder type, cylinders opposed, the mixture being taken into the crank case; then, by means of ports, admitted to the cylinders, as in the ordinary motor of this class. Jump spark ignition is used, the application being such that the motor may be reversed by shifting the controlling lever so that the spark may take place on the compression stroke. The flywheel weighs 125 pounds, and the motor, complete, 225 pounds. It develops 5 actual horsepower and is guaranteed in that respect. Speed control is such that the engine may be run from 100 to 1,000 revolutions per minute. Cylinders are water jacketed and are cast in one piece, thus doing away with joints around the heads. The engine is supplied with mufflers, battery, spark coil, switch, extra heavy insulated wire and mixing and spraying carbureter valve. All engines are run and thoroughly tested before delivery and memorandum of test will be supplied with each engine if desired.

In one of last Sunday's New York papers there appeared a large advertisement, offering stock in the American Rubber Works Co. at $25 for preferred shares and $15 for common. The par value of each is $25. The capital is $1,000,000, of which $200,000 is 7 per cent preferred and the balance common. The company's works are at New Brunswick, N. J.

Chicago has an automobile commission consisting of Health Commissioner Reynolds, City Electrician Ellicott and City Engineer Erickson. They have decided that 8 miles an hour is fast enough in the city and 12 miles in outlying districts.

THE STORY OF THE RACING CYCLISTS

Will Open the Season Early—Batchelder Returns From the South—Pace-Follower Wanted in Paris—Bald's Necessities

NEW YORK, March 30.—Cycle racing will begin this season in the Metropolitan district two weeks earlier than in any previous year in its local history. The Vailsburg Sunday meets will start on April 13.

"What is the use of waiting until the first of May for our sport?" asked Fred Voigt yesterday. "Baseball and the other outdoor games are in full blast by the middle of April, and why should we delay? Kramer, Krebs and Hadfield and a whole bunch of amateurs are already training at the track and eager for the races to start. Freeman and Monroe will be at the track on Monday, and as soon as possible I shall send word to the professionals now at Atlanta, Boston, Hot Springs and New Haven, and they will all come flocking here.

THE OPENING PROGRAMME.

The opening programme will be made up of a half mile open and a 2-mile handicap for professionals, and a half mile novice, a quarter mile open and a five-mile handicap for the amateurs.

Mr. Voigt will devote himself this year to to general supervision of his tracks at Vailsburg and New Haven. Edward M. Voigt will be resident manager at the former track, and Sol Du Vries at the latter. At New Haven special effort will be made to boom cycle racing among the Yale students and to encourage intercollegiate competitions.

TRAINING AT MANHATTAN BEACH.

The training quarters have opened at Manhattan Beach, but no definite announcement has been made of the plans for the season at the track "swept by ocean breezes" beyond the fact that James C. Kennedy had secured several dates.

McFarland, by the way, has joined Tommy Hall and Albert Champion on the Kennedy string.

The Jersey City track will be built in connection with the Eastern League baseball field, and there is talk of promoting amateur events on the track to precede the Saturday contests on the diamond.

Many of the sprinters have the pace-following fever; but defeats will drive some of them back into the short distance fold before the season is very old. There are promising ones, however, likely to last in the motor game. Freeman is to ride for Klosterman & Elim at Philadelphia, Baltimore and Washington.

WHO WANTS TO GO TO FRANCE?

Victor Breyer, owing to Stinson's illness, is sorely pressed for an American pace follower at his new Buffalo Coliseum track at Paris. Walthour was cabled for, but preferred to remain in this country. An effort may be made to get McFarland to go over and fill the aching void. Few believe that Jimmy Michael will meet with enough success abroad to stick to the horses, and many look for him to come back here and freshen up the motor game before the season closes.

BALD NEEDS THE MONEY.

Eddie Bald, reports from Hot Springs say, is really in earnest about his return to the track. He really needs the money, as his recent business ventures, to say nothing of his extravagant style of living, have left him compelled to do something at once. He has a terrific sprint at the finish. The new style—a loaf to the last lap and a dash for the tape—should suit his style of going to a dot and not be too great a strain on his strength.

CHAIRMAN RETURNS TO WORK.

"Batch" has returned from his southern trip much improved in health and strength and full of enthusiasm for the coming season. He does not favor an extension of the national circuit season. He believes in a short, sharp two-months' fight for the championship. "It will give me," he says, "a chance to go up in New England and arrange a preliminary circuit, just as we used to have a New York state circuit in June in the olden days. This preliminary circuit will put the men in fine shape for the real championship struggle."

Export Trade Steadily Increasing

The exportation of American bicycles is steadily increasing. The treasury department reports show that the value of exports for February, 1901, was $240,892, and for February, 1902, $308,030. For 8 months ended February, 1901, they amounted to $1,253,862, and for the same period ended February, 1902, $1,489,142. The value of automobiles exported in February was $34,500, and for the 8 months to the end of February, $429,182. The principal increase in the cycle trade was with Germany, which was five times as great in February of this year as in the same month last year. There was a slight increase in trade with Great Britain, and business with France was nearly doubled.

American Company's Stable Abroad

Information from Paris is to the effect that the branch of the American Cycle Mfg. Co. there will have eleven riders of prominence on its machines this season. The best known are Lesna, Aucouteurier, Fischer and Bourrotte, who has ridden in this country. The next firm in importance will be the French stable of Peugeot, which has engaged no less than seventeen men, among who are Jacquelin, Ellegaard, Meyers, Grogna and Gougoltz. The Gladiator people will have but one, Bouhours, while Clement has the services of Tom Linton and de Guichard.

The Buffalo Automobile and Auto-Bi Co. is now fully installed in its new factory on Niagara street, which was recently described in these columns. The place has 23,000 square feet of floor space and its present capacity is a dozen motors every day, but night work will be necessary from this time on. The building was erected especially for the company and houses an in-every-way up-to-date plant.

J. E. Bromley, president of the American Cycle Mfg. Co., who has been kept away from the factory a great part of the last 2 months by an injured foot, is now up and about again, though by no means well. Asked concerning the progress of business on Tuesday morning, he replied that it was everything that could be desired and that the factories were simply snowed under with work.

On April 13 and 20, at Paris, there will be a race of one hour each day between five riders, all of whom have been holders of the hour record. They are Elkes, American; Robl, German; Dickentmann, Dutch; Linton, English, and Edouard Taylor, French, although the latter, born of English parents, has adopted their country.

Major Taylor, as is well known, has long been a rider of the Iver Johnson machine. That he does it for glory alone no one will claim, but it is much to the credit of the colored rider that he has received and declined an offer of $5,000 to use a machine of French make during his stay in Europe.

There has been a slow but steady rise in American Bicycle Co.'s securities lately. After having been somewhere very near 2 the common stock sold last week at twice that figure, preferred stock and bonds also showing improvement.

It is asserted in Buffalo that the Hengerer company will turn out 30,000 machines this year.

TOOL STEEL BALLS

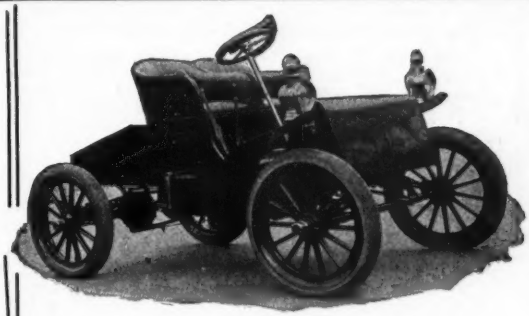
We make over 500,000 balls every day. Our plant is operated day and night to keep up with orders. All the large automobile makers buy from us. Our regular stock consists of balls in sizes from 1-16 to 4 in. in diameter.

THE AUTOMOBILE AND CYCLE PARTS CO.
CLEVELAND BALL AND PEDAL FACTORY
CLEVELAND, OHIO.

THE OHIO AUTOMOBILE COMPANY
WARREN, OHIO

Build....
Packards

Designed for
Reliability
Endurance
Speed
Long Distances
All Roads
All Weather



Model "F" Touring Car.
Made with Detachable Tonneau.

A SELF-PROPELLING CARRIAGE
ALWAYS READY

"Ask the Man who Owns One"

PARDEE & COMPANY,
1404-06 Michigan Boulevard,
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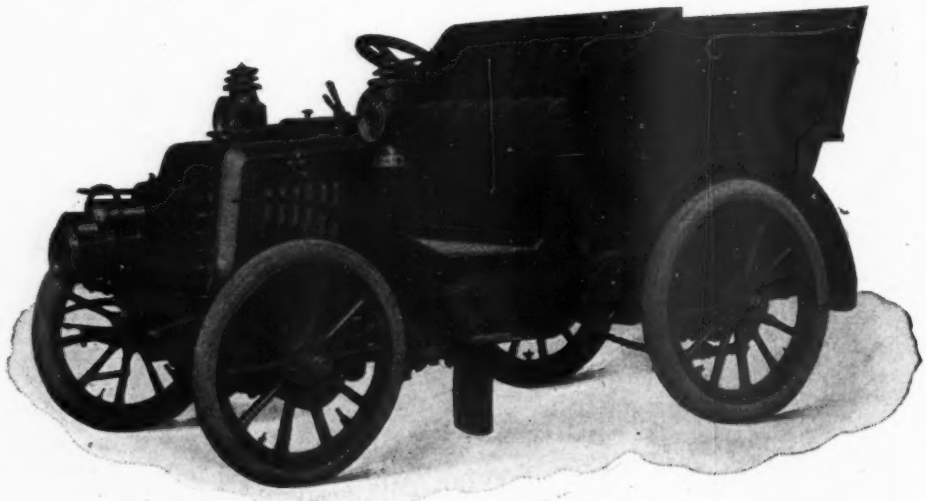
Distributers for the West

SMITH & MABLEY,

513-515 Seventh Ave., - - - - NEW YORK

7 1-2, 10, 15 HORSE POWER



8—50 HORSE POWER

NEW TYPE PANHARD.

F. CHARRON, GIRARDOT & VOIGT, 45-7 Avenue de La Grande, PARIS

F. Charron, Girardot & Voigt Automobiles (made in America) ready for delivery in July.

HAVE YOU SEEN

The Spaulding Gasoline Runabout?

THE BIG HIT OF THE AUTOMOBILE SHOW

An everyday Automobile for everybody.

Just the thing for pleasure or business.

PRICE, $650.00.

SIMPLE
DURABLE
ECONOMICAL

200 MILES
ON ONE CHARGE
OF GASOLINE

Most Liberal Terms to Agents.

Spaulding Automobile & Motor Co.

63 Chandler St., Buffalo, N. Y.

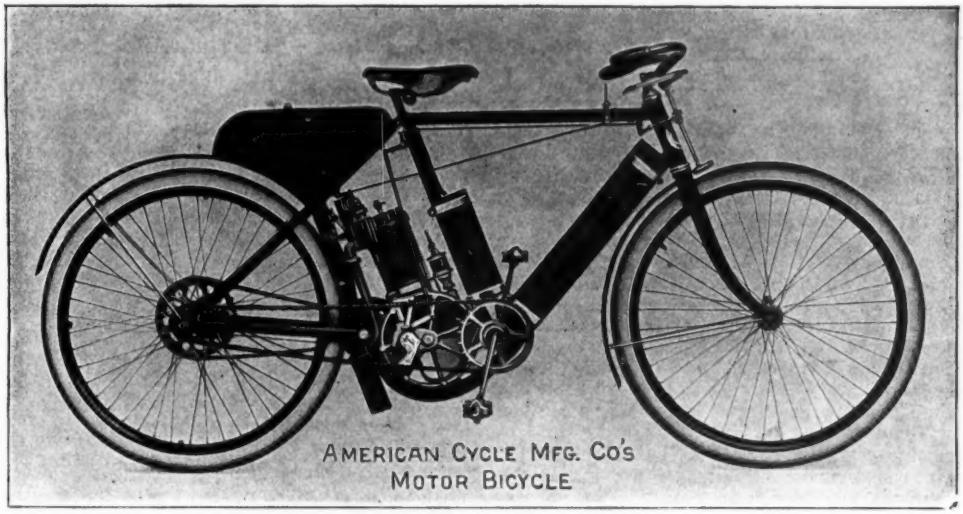
BIG CYCLE COMPANY'S MOTOR BICYCLE

Ready for the Market and Samples Are on the Road—Has Been Run 1,000 Miles—Simplicity and Stability, But No Extravagant Claims

"WHY doesn't the American Cycle Mfg. Co., with all its splendid facilities, make a motor bicycle?"

Such has been the question for months—indeed ever since the motor bicycle became a commercial possibility. Not until the occurrence of the Chicago show did it become generally known that the big concern would soon offer a machine of the kind and only within a few days, did its travelers take the road with one which the company believes will fill the bill to perfection and give to the rider such a machine as he has been seeking ever since the motor bicycle commenced to gain popularity.

In the course of its development, experimental models have been almost entirely rebuilt several times, although since the first motor-driven machine was put to a practical test on the road, nearly a year ago, it has at all times felt that it was in a position to place at the disposal of the public a superior motor bicycle.



American Cycle Mfg. Co.'s Motor Bicycle

HAS BEEN RIDDEN 1,000 MILES.

The machine illustrated and described dispenses with much complicated construction, develops great power in proportion to weight, secures ease of control and manipulation, and does away with unsightliness and uncleanliness. The model had been run 1,000 miles on the road previous to photographing, and had proved a complete success theoretically, mechanically and economically.

PLEASING IN APPEARANCE.

It will be noticed that its lines are harmonious and pleasing, strictly following the lines of the main frame tubes. Systematic and orderly arrangement characterizes the construction throughout. There are no unsightly clusters of bent pipes, levers and wires, no suggestion of overloading or top-heaviness. Each part is so placed as to sustain its proper mechanical relation to every other part, while the weight of the whole is so distributed as to contribute to steadiness of running and ease of steering. Every piece of the machine is made of the finest material obtainable for its special purpose, and every detail of construction and finish is of the highest class.

METHOD OF OPERATION.

The motive power is derived from a four-cycle 2¼-horsepower gasoline engine, with special and distinctive features and connections. It operates as follows: From a reservoir containing a supply of gasoline a certain measured charge is drawn and vaporized, the vapor mixed with air and the mixture admitted to the cylinder, where it is compressed and exploded by an electric spark behind the driven piston, and the products of combustion discharged through the exhaust valve. The explosive energy driving the piston downward imparts a rotary movement to the crank, whence the power is transmitted to the rear wheel by a double chain 8 to 1 gearing.

NEW AUTOMATIC FEATURES.

Certain operations essential to the working of this form of engine as applied to bicycles, which heretofore have been dependent upon manipulation by the rider, have been brought within the automatic control of the engine itself.

Manipulation of the pet cock, which has heretofore been one of the most awkward and troublesome details of getting motor bicycles under way, has been entirely superseded by an ingenious and unfailing device operated by means of the controlling lever on the handlebar.

The specifications of the machine, which is made under Columbia, Cleveland, Crescent, Imperial, Monarch, Rambler and Tribune brand, are here given:

Speed on level road from 4 to 27 miles per hour. In hill-climbing, a 20 per cent grade, as steep as is considered practical by modern road-makers, can be ridden unaided. A 25 per cent grade can be mounted with slight assistance from pedals.

The gasoline tank contains 6 quarts—sufficient to supply fuel for a 100-mile run. The battery mileage is about 1,000 miles.

The supply of gasoline and air in proper mixture is controlled by index levers on frame just back of bar. Complete control of the engine is obtained by means of the controlling lever without removing the hands from the grips. When the lever is depressed as far as possible the machine runs at full speed. Raising it to a point near the bar shuts off the power and applies a direct acting brake to the front tire. The rate of speed is governed by placing the lever in intermediate positions according to the pace desired. An electric switch on the opposite bar also admits of shutting off power instantly. In starting, an automatic

device causes application of power to be gradual, obviating violent initiatory motion. In taking on power after a coast, there is no violent explosion. In case the engine is disabled, it can instantly be disconnected and the machine driven by the pedals as an ordinary bicycle.

Motor power is supplied by a 4-cycle 2¼ H. P. gasoline engine. This engine, with its vaporizer, lubricator and muffler, is made complete in our own works, is simple in construction and contains all the very latest improvements.

A regular coaster brake is fitted to the hub of the rear wheel, and, in adidtion, a standard style of hand lever brake is applied to the front wheel, giving absolute control of the machine on all grades.

Used intelligently, as per the instructions accompanying each machine, the percentage of costs of repairs should be of so small an amount as to be not worth considering, and practically no greater than that expended on any ordinary bicycle.

Height of frame, 22 inches; wheel base, 53 inches; wheels, 28 inches; tires, 1¾-inch, single tube—rear tire extra heavy and mechanically fastened as well as cemented; spokes, 44 rear, 40 front; soft rubber grips; pedal gear, about 56 inches; motor gear, 8 to 1; free rear wheel, admitting of machine being run backwards; motor can be speeded to about 2,600 revolutions per minute; all parts specially heavy throughout; fitted with saddle, bag and tools complete. Finish, black. Weight, 115 pounds.

We agree with purchaser of our motor bicycle to make good by repair or replacement, within sixty days from date of sale by dealer, any defects in material or workmanship, provided the serial number is intact, and defective part delivered to factory, transportation prepaid. This guarantee does not cover damage by accident, misuse or neglect.

Price, $175 F. O. B. Hartford, Conn.

Celebrates Twenty-Third Birthday

The Massachusetts Bicycle Club is, with only one exception, and that one in its own city, the oldest bicycle club in the United States. On Wednesday evening of last week it celebrated its twenty-third birthday by a banquet which was attended by about 100 members.

The Massachusetts Bicycle Club was organized in March, 1879, and elected Col. A. A. Pope its president. Under able and efficient officers the club at once established itself, and during successive years maintained a high prestige and proud record. From its very existence it has identified itself with touring. Its club runs have extended through New England and out into neighboring states as far south as Washington, west to Chicago, and across the Canadian line into the Provinces of Quebec and New Brunswick.

The club emblem of the state seal has been carried by members into Mexico on the south, California on the west, and nearly every European country. A distinguished president of the club at that time was Col. Thomas Wentworth Higginson. The club has been an important factor in shaping legislation for wheelmen in municipal and state affairs, and was identified with the establishment of Patriots' Day as a state holiday.

At the banquet addresses were made by President E. W. McGlenen, Rear Admiral Belknap, Edward S. Crandon and Rev. Mr. MacQueen, American war correspondent in the Boer war. Capt. A. D. Peck, who has held his office in the club for 16 consecutive years, responded to the toasts "The Early Days of Cycling." Ex-Representative Arthur K. Peck told of interesting experiences in touring and in cycle mountaineering in the Rockies, the Alps, the Jura and Sierra Nevada mountains.

Clement's Estimate of American Machines

Writing to the Auto Velo, from Chicago, under date of March 7—Friday of the late show—M. Clement, the distinguished French maker of automobiles and cycles, says: "Without taking time to go to a hotel I went direct to the show and I am glad I did not miss it. To my supreme satisfaction I discovered that these good Yankees, so superior to us in a great many things, are quite inferior to us in the automobile industry. I think they are at least five years behind us."

CANADIAN TRUST IS IN TROUBLE

Shareholders Sue Directors and Allege Grave Irregularities—Said to Have Profited by the Promotion and Asked to Refund

TORONTO, Ont., March 27.—There has been trouble brewing for the directors of the Canada Cycle & Motor Co. for a long time. First of all, one of the promoters of the trust commenced suit for commissions and now the dissatisfaction which was manifested at the annual meeting has culminated in the courts being asked to investigate the affairs of the company. Messrs. Lamporte and Ferguson, on behalf of George W. Bedell, issued a writ against the directors asking for an account of their dealings with the concern.

ACTS FOR THE STOCKHOLDERS.

Mr. Bedell stated that he was acting for himself and all other shareholders. The directors named are Hon. George A. Cox, Hon. Lyman Melvin Jones, Edmund B. Ryckman and Warren Y. Soper, and the executors of the late W. E. H. Massey, who was a director, Mrs. Susan Denton Massey, Chester D. Massey and John H. Houser. The endorsement on the writ is as follows:

CAUSES OF THE TROUBLE.

"The plaintiff sues on behalf of himself and all other shareholders of the Canada Cycle and Motor Co., except the defendants. He asks (1) for a declaration that the defendants were the promoters of the company and the agents of the company in all matters relating to its organization and the flotation of its stock, and to the acquisition by it of the bicycle businesses of the Massey-Harris Co., H. A. Lozier & Co., the Welland Vale Mfg. Co., the Goold Mfg. Co. and the Gendron Mfg. Co.

WANT THE PROFITS UNEARTHED.

"2. For discovery of the profits made by the defendants, and each of them, as such promoters and agents.

"3. A declaration that the promoters failed to disclose such profits to subscribers for the capital stock of the said defendant company.

"4. An order that the defendants other than the company account and pay over to the company the sum of $342,000 paid to them in cash in excess of the price paid to them for said business, and all other profits made by them.

"5. An order that the promoters do account for three million dollars ($3,000,000) of the common stock of the company issued to them without any consideration therefor."

Weekly Bulletin For Cyclists

There is a rumor—it may be nothing more—that the bulletin heretofore furnished members of the League of American Wheelmen may be the cause of trouble. The ex-publisher is said to be angry at the placing of the rights to publish the league news with another journal and to claim that certain of his rights, under his contract with the league, have not been respected. But for the good of the league and for cycling generally it is desirable that the members be given the news more frequently than they have been able to obtain it heretofore. The bulletin, in days gone by, did a great deal to keep the members in touch with each other and to keep the interest of all concerned at concert pitch. Hence, if the new publication proves to be made of the right kind of stuff, the membership should be largely increased.

The Difference

Between an IS and a MAY BE
Between a CERTAINTY and a DOUBT
Between a SURE THING and a GAMBLE

THAT'S *the* DIFFERENCE

Between The

MorrowCoasterBrake

and practically all of the others.

Some other Coaster Brakes

..MAY BE..

All Right. You are Absolutely Sure That the Morrow

....IS....

Right.

You take no chances, run no risk, trust to no luck, and act as no inventor's or manufacturer's experimenter or tester, in using a Morrow or in selling it. It is a known quantity, the Standard,

THE LEADER, THE "IS" THE CERTAINTY,

the sure thing in Coaster Brakes. It has been tested and found true on all kinds of bicycles, built and ridden by all kinds of men, in this country and in all others.

It is risky business fooling with a "may be" or a "just-as-good." Don't do it. Play safe and preserve your trade and reputation.

Eclipse Manufacturing Co.
Elmira, N. Y.

A weak link will render the strongest chain useless, and a poor tire will make the finest automobile a source of worry and danger

An Automobile with

MUNGER

Non-Collapsible Pneumatic Tires

Has 80 per cent of its possible troubles obviated. We have a proposition which will interest you

Munger Automobile Tire Co.

TRENTON, N. J.

New Kelly Generator ...

For Steam Vehicles

mproved—Perfect in Every Way

Drip cup unnecessary in starting—Aluminum case over generator—All connections on the outside—Strongly made—Easily adjusted—No flaring or flashing in lighting, even in strong wind. A quick and powerful generaton—Main fire valve controlled at seat—Small and neat in appearance and adapted for any machine.

Our new One-Piece Cast Burners have been greatly improved both in power and strength. No wedged tubes in its construction. All in one piece and easily cleaned.

Address, KELLY HANDLE BAR CO., Cleveland, O., U. S. A.

ROLLER BEARINGS AND THEIR USE IN AUTOMOBILES

Professor Hele-Shaw, a scientist of great repute among British automobilists, delivered an address before the last meeting of the Automobile Club of Great Britain and Ireland on the subject of "Roller Bearings."

He started by illustrating, by means of models, the manners in which motion may take place between two bodies, and showed that by sliding on each other every particle of the body in motion moved tangentially over the particles of the body at rest, while in the second case where one body rolled upon another the particles of the body in motion have a movement normally with reference to the particles of the body at rest. Ordinary plain bearings came under the first head, while roller and ball bearings were comprehended under the second.

SHORTCOMINGS OF PLAIN BEARINGS.

With plain bearings, said the lecturer, resistance was particularly felt in starting from rest, where friction became what might conveniently be termed striction. Striction might be caused by the locking of the particles into each other and by the adhesion and cohesion of the lubricating material, and was a matter of importance with regard to the bearings of motor cars, for in motor cars it was of the highest importance that the starting effort should be as small as possible, while the running effort should be reduced to the smallest proportions.

ILLUSTRATED BY LANTERN SLIDES.

In the question of starting from rest, or easy running in actual motion, or uniformity of action, the roller bearing presented such great advantages for motor cars that it was well worth considering what the difficulties were which have prevented them from becoming universal.

Professor Hele-Shaw first dealt with the mechanical action taking place when one body rolls upon another, and in order to demonstrate this he showed a slide upon the screen whereby a small wheel rolling on a plane traced by a point in its circumference a line on the smoked glass of the slide. The slide shows this, and that where the wheel or roller came into contact with the fixed surface it approached it normally, rested upon it for an instant, and left it again normally in a perpendicular direction.

THE ADVANTAGES OF THE ROLLER BEARING.

This, said the professor, indicated the peculiar advantage of roller bearing, because the two surfaces in the ideal conditions showed no relative sliding at all, and therefore, theoretically, no friction.

The flat path must be considered as bent round in the form of a circle to form the outer bearing surface of a roller bearing, and a succession of little wheels following one another continuously round such a circular path represented the action of the rollers upon the outer roller path.

The relative action of the axle on the rollers could, said the lecturer, be understood by imagining the wheel and path to be inverted. In that case a point on a roller would make a curve as shown on screen, the successive points of contact on axle and roller approaching each other without any sliding action. The upper surface or flat path in actual practice would be curved round to represent the circumference of the axle, and then the outer and inner circles representing axle and roller path between which the rollers rolled would be conveyed to the mind.

PRACTICAL DIFFICULTIES.

This brought them to a position to consider the difficulties in bringing this theoretically perfect combination into practical operation, and these difficulties the lecturer gave under heads as follows:

1. The concentration of load at a point.
2. The expenses and difficulty of obtaining rollers truly circular and cylindrical.
3. The rubbing of the surfaces of the rollers themselves.
4. The difficulty of adjustment.
5. The twisting or the want of parallelism of the rollers relatively to each other when slightly worn.

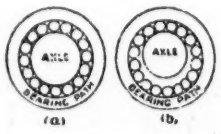


Fig. 1.

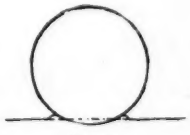


Fig. 2.

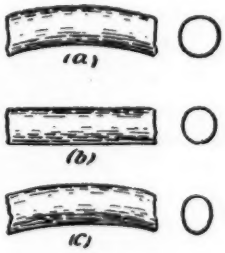


Fig. 3

Fig 4

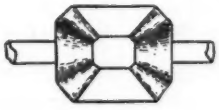


Fig. 7.

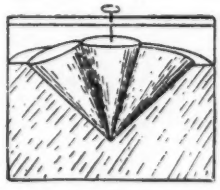
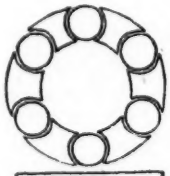
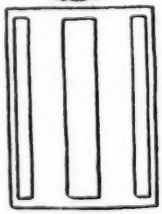
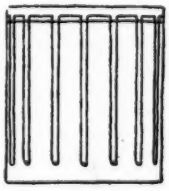
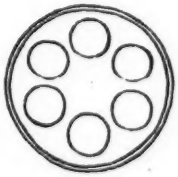


Fig 6.




Brennan.
Fig. 5.


Mossberg
Fig. 5.



The Brennan
Fig. 5b.

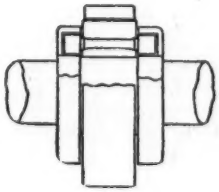


Fig. 5a.

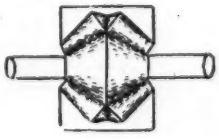


Fig. 8.

6. The difficulty of providing for end action or side pressures.

7. Hammer blows and shocks with motor cars when wearing has occurred.

DESTRUCTIVE AGENCIES EXPLAINED.

Professor Hele-Shaw then proceeded to make item 1 particularly clear by an ingenious lantern experiment, in which two wheels were seen rolling upon each other on the screen. It was seen that with sufficient frictional contact to drive each other the extent of surface in contact was practically a point. This in a roller would be a line of contact. Euclid's definition of a line, however, is "length without breadth," and the theoretical area of contact is just as small in the case of a line as in the case of a point which has no parts and no magnitude. To any extent whatever, however small, that the surface of contact deviates from the theoretical line the action between the two surfaces deviates from the theoretical rolling contact, and involves sliding or frictional contact proportional to the deformation of the roller.

This action had been investigated, and was now understood. If the surfaces were elastic a wave, as shown in Fig. 2, was produced.

The chief disadvantages from this were (*a*) the loss in friction taking place without theoretical rolling; (*b*) the gradual fatigue and disintegration of the metal surface which causes it to scale; and (*c*) the actual production of flats, causing permanent deformation when a great load comes suddenly or is continued for a long time upon the surfaces in contact.

These are all serious—the second resulting in the destruction of the rollers.

Professor Hele-Shaw, again employing the beforementioned lantern model, produced a flat upon the wheels, and showed that such a flat not only interfered with proper rolling, but as the flat was increased obviated the rolling altogether. To obviate this, said the professor, it was necessary to make the rollers and surfaces of roller case and axle as hard as possible.

POSSIBILITIES OF ERROR.

(2) No lathe was ever made which turned an absolutely perfect cylinder, yet steel rollers could be turned sufficiently near for any roller bearing. But such rollers would not retain their cylindrical and circular form after hardening. A body might be circular and not cylindrical, and cylindrical and not circular, a cylinder being the surface formed by moving a straight line parallel to itself whether it moves in a circle or not, and further, a deformation from the circular form was also possible and probable. These possibilities are shown exaggerated in Fig. 3.

These deformations might occur separately or together. To correct such deformation the rollers might be ground by a revolving emery wheel, and similarly the roller paths. But this process was very expensive, and such mechanical treatment rendered the price of roller bearings so prohibitive that the process of grinding was seldom properly performed. Hence, it was doubtful if rollers ever absolutely conformed when hardened to their proper shape.

CURE WORSE THAN THE DISEASE.

(3) It was seen by Fig. 4, a section of an axle bearing, that the rollers in contact rubbed against each other, as the sides in contact moved in opposite directions. This was not so serious a matter as it seemed, but various devices for separating the rollers had been devised, though in many the cure was worse than the disease.

(4) The difficulty of adjustment was evident, for with the rollers fitted as in Fig. 1a in contact and filling the space between axle and path, they could never really fit the path after the slightest wear. When this had occurred, Fig. 1b represented the condition of things in an exaggerated form, and no method of adjustment similar to that employed with bicycle ball bearings existed. Cone roller bearings, however, had been invented in which adjustment could be effected.

ONE OF THE GREATEST DEFECTS.

(5) The twisting or want of parallelism was one of the greatest defects of roller bearing. This took immediately upon wear, and had been found particularly by Professor Goodman, of Leeds, to be the chief cause of objection to the bearings. Some methods for coping with this were shown in Fig. 5. In the Mossberg roller bearing gun metal cages carefully machined out were used, and the professor handed round some of the actual Mossberg frames containing rollers held in their place by an ingenious attachment.

The Empire roller bearings had a cage of a different form to the Mossberg, which appear in section as wedge-shaped pieces. This bearing seems to act most effectively and has been used largely for rail and tram bearings.

Another type of separating piece with small rollers was shown in Fig. 5a.

BRENNAN'S INGENIOUS INVENTION.

Professor Hele-Shaw then showed an extremely ingenious invention by his friend, Mr. Brennan, of torpedo fame, in which a cage wholly or in part of a metal having a melting point at a temperature less than that which would destroy the hardness or temper of the rollers forms part.

The rollers were temporarily held in a suitable mold in the relative positions that they are to occupy in the cage, as shown in 5b. The molten metal or alloy is poured into this mold, thereby casting the cage about the rollers.

By this means a cage consisting of a single casting of any desired form, and containing the rollers partially embedded and locked with only their opposite sides protruding and visible above the levels of the surfaces of the cage, but all capable of rotation about their axes, was formed.

After the casting the bearing was slightly expanded by forcing a mandril through it so as to force the rollers slightly farther apart and insure their rotating freely in their sockets. A small bearing of this kind was circulated for inspection, and it was noted how smoothly the rollers turned therein. From experiments Mr. Brennan found the wearing properties as well as the smallness of the resistance of this bearing to be very marked.

(6) In the case of a motor car, the bearings were subjected to considerable end thrust. Attempts had been made to take up such end thrust by inserting rings of balls, but these ideas were based on a misconception of the rolling action of the balls relatively to the nature of the rollers against which they are supposed to press.

THE ADOPTION OF CONE ROLLERS.

A mode of adjustment which had features of interest was the adoption of cone instead of cylindrical rollers. The professor produced a well made model in wood, which is here represented in Fig. 6, and showed practically how perfect was the action of the conical rollers. But he admitted that the same difficulties that occurred in the hardening of cylindrical rollers occurred even to a greater extent with coned rollers, as he had found in making them.

This kind of roller was by no means new, and numerous attempts had been made to make cone rollers, but in all cases which had reached him the cones were turned outward, and the thrust in this case really was taken up by rubbing end pressure, the aim of such bearings being chiefly to obtain adjustment almost impossible with parallel bearings. (These roller bearings, with the large end of the frusta outward, are shown in Fig. 7.) In this case there was side pressure of the cones outward, which must be resisted by rubbing action of some kind. By turning the frusta in the opposite direction,

NOTHING CAN EXCEL A BUFFALO

For Easy Starting, Getting Away Quick, Swift, Gliding, Noiseless Motion and Endurance ....

The "Buffalo" we are talking about may not be the one you are thinking about, but it will apply equally well to both. We refer at present to our

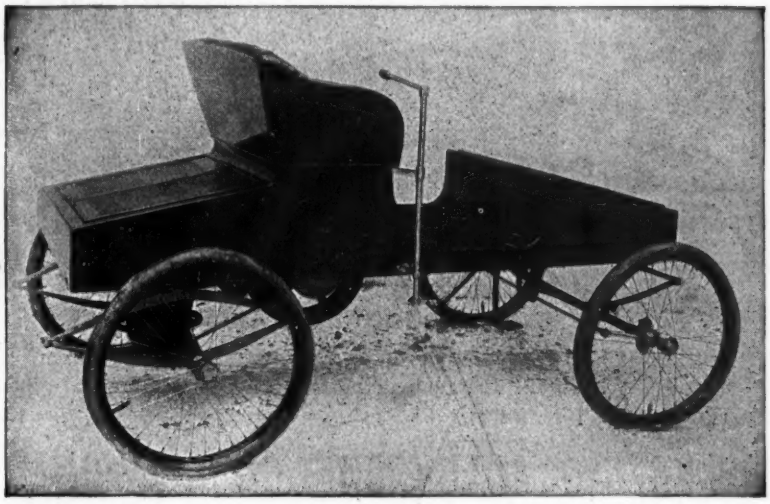
Buffalo Sr.

Here it is

One ride will convince you.

MR. DEALER.

Come to our factory, take a ride, and buy.



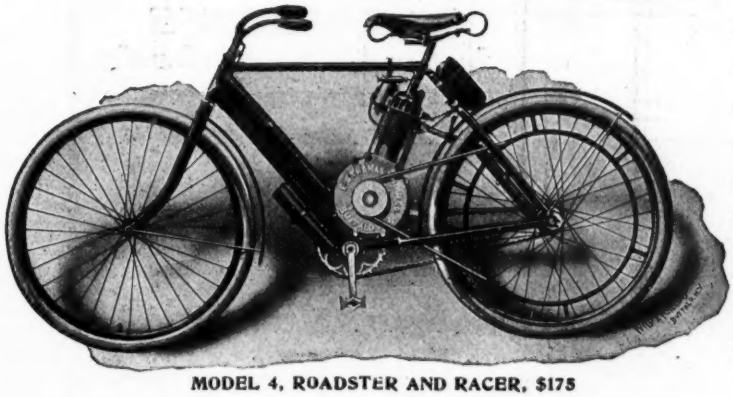
BUFFALO, SR. PRICE $800

"AN AUTOMOBILE IS NO BETTER THAN ITS MOTOR"

We use E. R. THOMAS' WORLD'S RECORD MOTORS exclusively.

DON'T FORGET THE AUTO-BI! THE STANDARD MOTOR CYCLE

Largest Discounts to Good Agents.



Two and one-half horse power motor, grip control, narrow tread, up-to date epuipment, full and substantial guarantee. Made in a factory especially equipped for the purpose. All parts are interchangeable.

MODEL 4, ROADSTER AND RACER, $175

AGENTS: Get the benefit of our wide experience. Don't take up an unknown quantity when you can get one already popular. One tried and not found wanting. Catalogue of three models ready.

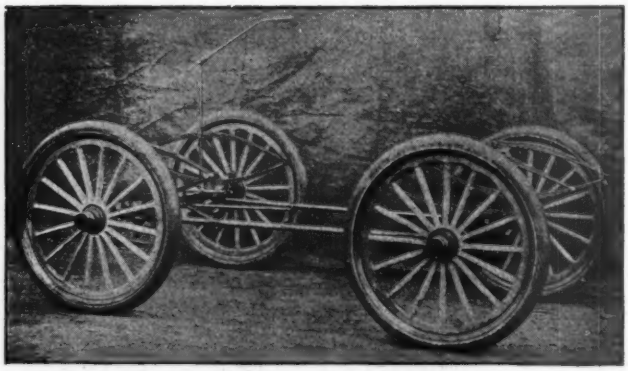
BUFFALO AUTOMOBILE & AUTO-BI CO.,

BUFFALO, N. Y., U. S. A.

LONG DISTANCE TELEPHONE.

AUTOMOBILE RUNNING GEARS

Get a Running Gear that is Past the Experimental Stage and Build a SUCCESSFUL AUTOMOBILE

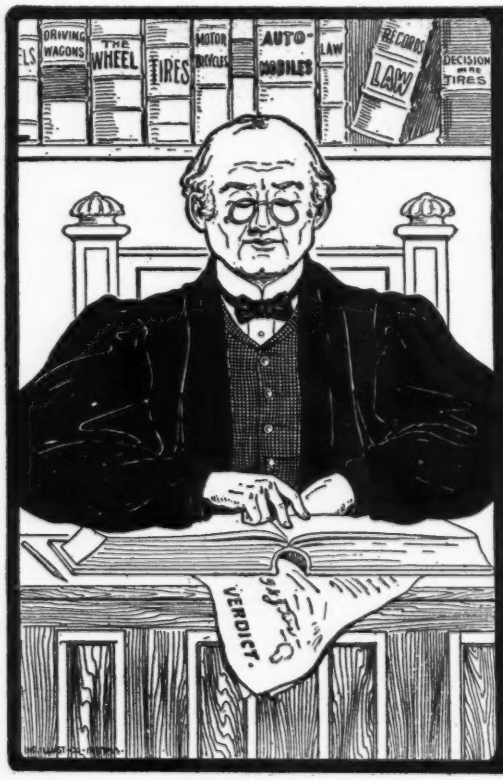


We Make Two Styles Complete With Springs and Wood Wheels, Solid Rubber or Pneumatic Tires : :

....OUR SPRING BLOCK BEARING IS SELF-ADJUSTING....

and you ought to have it. It is made for revolving axles and is pivoted between the bearing and spring block, enabling the bearing to move free and easy with the axle always. Our catalogue tells all about it

THE BRECHT AUTOMOBILE CO. 1201 CASS AVE., ST. LOUIS, MO.



THE VERDICT

of all who use
G & J TIRES
is that they embody all the requirements of THE IDEAL TIRE—
Strength,
Speed,
Durability;
Simplicity,
Ease of Repair

CATALOGUE UPON REQUEST.

G & J TIRE CO.

INDIANAPOLIS, IND.

MAKERS OF G & J DETACHABLE TIRES FOR VEHICLES OF ALL KINDS

as shown in Fig. 8, the cones could not only be made to roll upon their conical sides, but upon their conical ends, and both the side and end pressure taken up by rolling motion. A few lantern slides, giving various ways by which this could be done, were thrown on the screen, the professor explaining that, although this form of bearing had not been employed hitherto for motor cars, it had given very good results in its application to an artillery wheel.

UNIFORMITY OF HARDENING ESSENTIAL.

(7) The professor pointed out that if bearings were not adjustable, or if adjustable were not kept properly adjusted, in motor cars, there must be a considerable amount of hammer blow or shock, of which all probably had had experience with ball as well as roller bearings, in which broken balls and broken rollers, revealing a state of things under which it was astonishing that the car could have continued to run at all, had been found. He had no doubt that the actual smashing of the balls or rollers was caused by the hammering action taking effect upon a roller or ball in which there was a want of uniformity in the hardening, and a consequent state of initial strain in the material.

When such a roller or ball is subjected to repeated shocks, owing to a slackness and want of adjustment, it must ultimately be broken.

The lecturer said he did not propose to give figures concerning the saving in power by the adoption of roller bearings, although numerous figures had been published in the cases of shafting, tramcars, railway wagons, and even heavy road vehicles, but he did not know that the matter had ever been really investigated with reference to the motor car. He did not think the great advantages of a roller bearing would be disputed. The question was not so much the saving in power and diminution in starting resistance, but the practical difficulties and expenses involved in the use of such bearings. These were the difficulties which hindered their general introduction, and these were therefore the points he had brought forward for consideration.

The Workingmen Were Interested

Before the Workingmen's Club, of Hartford, a few days ago, H. W. Alden, chief engineer of the Electric Vehicle Co., delivered a lecture to an attentive audience on "How Automobiles Are Made and Their History." Touching briefly on matters of history, Mr. Alden said that the first automobile he had heard about was depicted in the hieroglyphic records of Egypt, which showed a car propelled by the ejection of steam. The first authentic machine was, however, constructed by Cugnot, a Frenchman, in 1771. This machine made 2½ miles an hour. In 1808 Treveithick in England constructed two vehicles, one for rails and one for roads, which were used for a short time and then broken up. From 1822 to 1840 there were a nmber of large steam-coaches built and operated about London and the suburbs, which were far from being failures. The development of the railway, however, turned all attention to its possibilities and the road machine was neglected. The year 1865 marked a new era for the automobile, as in this year the first use of oil as fuel for the automobile was tried. This was the entering wedge for the petroleum-driven machine. The use of steam was again taken up in 1882, when the first light, compact steam machine was built in France. In 1885 a tricycle equipped with the new invention made 36 miles in an hour. In 1889 Sorpollet became famous for bringing out the first flash type of generator. Continuing, Mr. Alden said:

"In this form of boiler there is no volume of water, from the surface of which steam escapes, but a certain, fixed quantity of water is pumped into highly heated coils and instantly vaporized. Sorpollet has probably succeeded in bringing it to its highest present development, although others are now working on similar lines in this country—notably Professor Elihu Thompson and the White Steam Carriage Co. In England little has been done with the flash type, largely, probably, on account of the success of the Thornicroft water-tube boiler.

"While the boiler is of prime importance, the engine comes next. Here it is that we find all kinds, single-cylinder, multiple-cylinder, horizontal, vertical, single-acting, double-acting. It seems very queer that our steam friends should not have availed themselves of the experience gained by their gasoline rivals and followed the general lines of automobile design which the latter have so successfully worked out. A vertical, single-acting, three-cylinder compound, located forward of the dash, would certainly seem to meet all the requirements, as does a similar gasoline arrangement. True, some have come very near this, Professor Thompson in this country and the Coulthard company in England having engines on these lines, but they stop there. I will not go any further on the steam question, for its general features are too well known. Suffice it to say that in heavy traffic there seems to be a very large field open which steam can successfully fill.

"Coming now to the electric, we find that the electric automobile is much younger than its steam brother—younger almost than its other brother—petroleum. While, however, petroleum was used in a few isolated cases prior to electricity, the latter reached a commercial stage earlier and so merits first treatment. Rafford in 1881 built a small tricycle and also a tramcar operated by accumulators in an experimental way only. In 1885 Magnus Volk in England and Gustave Trouve in France produced small electric machines the former a dog-cart; the latter a tricycle. Of all the Europeans engaged in electrical work on automobiles, three names stand out most prominently—Jeantand, Jenatzy and Krieger—all of which names are doubtless familiar to you all through press reports of their doings at the various recent automobile tests, both in France and in England.

"Jeantand began in 1881 by building a phaeton equipped with a Gramme motor. In 1887 he substituted an Irmusch motor and in 1893 a Thurly motor. In 1895 he built a six-passenger vehicle which, as No. 25, took part in the memorable Paris-Bordeaux race. He met with failure so far as the race was concerned, but found out a lot about electric vehicles which was of far more importance. Krieger merits special mention in that he developed two unique features, one. the use of the front wheels for both driving and steering; the other, the use of his motors as electric brakes, using the energy so generated to recharge his batteries. Both of these features were new. The reason for front-drive and steer, as this system is generally called, is that the tractive effort is less than if the power is applied at the rear."

Mr. Alden said that the advance of the electric automobile in the United States had been much more rapid than in France, and while a few spectacular plays had been made with the machines, a healthy reaction to practical use had resulted. The electric machine seems to appeal more to the people here and ten are used to one in all Europe combined. The speaker then used diagrams on the blackboard to illustrate the different parts of the electric automobile. He began his explanation of these parts with the battery. He gave the details of composition of the various forms of batteries used. He spoke of the new battery about to be put on the market by Edison and said that its great value was in its indestructibility and not in its great capacity.

The desirability of using one or two motors on a machine was also taken up. The speaker believed that only one motor should be used on light machines, while on the heavier machines two motors might be

advantageous. The transmission of the power to the wheels by either gear or chain was also discussed and the merits and demerits of the systems explained. The chain is more quiet than the gear arrangement, but there is a possibility of this being remedied. The runs made by electric vehicles were spoken of, one making 187 miles last year in the west, while in Europe a machine made 200 miles. In a commercial sense the electric machines can make from forty to fifty miles. The electric machines are coming into use for heavy trucking.

The petroleum, or as more commonly called, the gasoline machine, was then taken up and explained. The first successful machine of this kind was made in this country in 1879. The speaker said that the Frenchman would put up with mechanical arrangements of these machines which the American would not tolerate. A multiplicity of levers, pedals, oil cups and what-not is a delight to the Frenchman, but a source of annoyance to the American. Hence, European development has been along non-automatic lines of vehicle control, while we in this country have striven towards the push-button ideal. This has been augmented by the prevalence of the electric vehicle, with its great ease of control. On the score of noise, the American is driven crazy by what charms the European ear, and hence forms of motors and gearing have been differently developed. To the credit of the American engineer it can be said that the Europeans are themselves turning from their high speed and noisy motors, to our slower speed type; from their extreme hand control of all functions to our more automatic features, and from their noisy types of gearing to ours, in which fewer gears are running. On the other hand, the speaker believed that the Europeans are nearer the mark than the average American engineer so far as the general arrangement of vehicle organs is concerned. Therefore in taking up the details of the machine he followed the European distribution of elements, which briefly is about as follows: In front of the dash is placed the vertical engine, its cooling coil being carried on the extreme front of the bonnet covering the engine. Then comes the flywheel, in whose back face is some form of friction clutch for disconnecting the engine from the transmission. Thus follows the gearing containing the two, three or four-forward speeds and reverse, power being delivered from this point to the wheels, either by a short fore-and-aft shaft driving a rotating axle by means of bevel gears, as in the lighter forms, or by a countershaft itself driven by bevel gears and in turn driving each rear wheel by means of a chain.

The reach which was common in American machines is not present. The platform carrying the engine, transmission gear and body is supported from the front axle by half-elliptic springs, which serve to drag the axle along, and from the rear axle by either full or half elliptic springs. Among American manufacturers the reach is also gradually disappearing and will doubtless be superseded by the reachless form.

Why the Flash Boiler Does Not Scale

When flash boilers were first proposed for motor cars, the experts who had not tried them said the scale deposited in such narrow tubes would choke them in no time. When the bolder spirits found they did not choke at all, the experts said the scale was blown off the inside wall of the tube by the rush of steam, or else cracked off by the heat of the tube. My theory, says J. Brown in the English Mechanic, is that scale never gets on. The experts were thinking simply that all boilers scaled, therefore this one would. They omitted to consider an essential difference. In ordinary boilers the water is in intimate contact with the iron; and the lime in solution, gradually depositing in crystalline form by evaporation of the solvent, fixes itself on the solid with which it is in contact. In the flash boiler the water is not in contact with the metal, but is separated from it by a layer of steam through which the heat passes to the water. Any solid deposited by evaporation is therefore isolated by this steam layer, and forms in small particles in the water. It has no chance to attach itself to the metal tube.

Lakewood as an Automobilists' Resort

Lakewood has become a mecca for automobilists in winter. In the automobile house, as the storage station established by the enterprise of one Joseph Hoff is called, are stored an average of thirty vehicles all the time. They belong to members of the New York, Philadelphia and Boston automobile clubs wintering among the Jersey pines. George Jay Gould has a big automobile stable, with vehicles used by himself, Mrs. Gould and their boys. Prominent among the motor vehicle clubmen there have been George F. Chamberlin, Albert C. Bostwick and William Murray, of the New York club, Mr. Morse of the Massachusetts club and several officers of the Automobile Club of Philadelphia.

Lakewood is the center of an extensive system of gravel and stone roads. Almost daily parties of touring automobilists arrive there from New York, having come by routes over stone roads all the way. There are two ways of reaching this winter resort from New York. Either by taking the Twenty-third street ferry to Jersey City, thence by the plank road to Newark, and on through Elizabeth, Rahway, Metuchen, New Brunswick, Old Bridge, Jamesburg, Freehold, Hurkey and Squankum to Lakewood, a distance of 73 miles, or by a shorter and better route across Staten Island to Tottenville, Perth Amboy, Metuchen and New Brunswick, and from there on as by the first described route.

South from Lakewood one has a grand road for fifty miles through Tom's River, Cedar Creek and Barnegat to Tuckerton, from which the Atlantic City road from Philadelphia is reached by crossing Waiting River. The 10-mile stretch from Lakewood to Point Pleasant, connecting there with the shore road extending from Sandy Hook to Bay Head, is being macadamized and will shortly be completed.

Automobiles in Yosemite National Park

"In the great Yosemite National park in California, where horses and mules have been used for sixty years, there will soon be a line of stage coach automobiles carrying sightseers along the cliffs, over the mountain trails and down into the wonderful valley itself," said Mr. A. H. Washburn, part owner and superintendent of the Yosemite Stage and Turnpike Co.

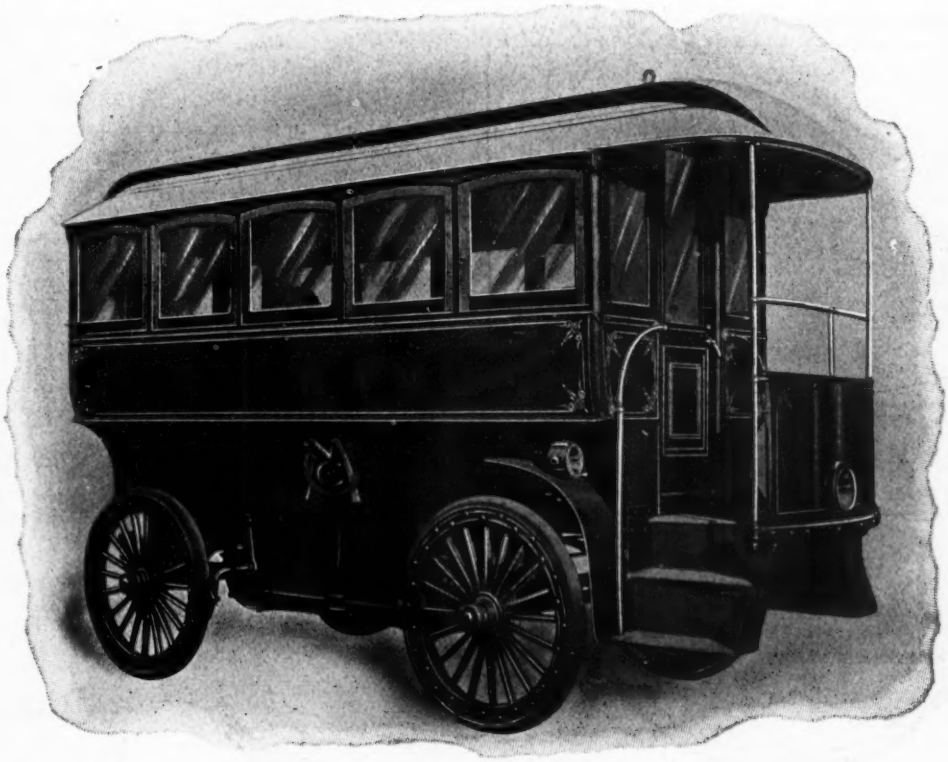
"A great deal of the distance the road is built through the solid rock, where we had to blast to make a way for ourselves. It was in 1861 that I first began to take people into the valley over the trail, and the need of a road grew in proportion to the number who visited the place. Necessarily the roads are very rough.

"Raymond is 200 miles from San Francisco by train. There we make our headquarters. We shall run autos from there into the valley, a distance of sixty miles, over very good roads. We own the roads. We would sell them to the government if it wanted them, but are not anxious to sell.

"Inspiration Point, where you catch a view of the great valley, is 7,000 feet high and is 6 miles from El Capitan. The Bridal Veil falls, which plunges like a white mist from a height of 900 feet, looks like a tiny brook falling over a little rock.

"Since we built the first road into the park in 1874 we have built many miles of side roads around the valley. I have arranged to put on a number of autos by April 1."

The Greatest Money-Maker In The World!



THE CHICAGO AUTO-COACH.

Two sizes, carrying sixteen and twenty-two passengers. Abundantly powerful, strongly built, elegantly finished and upholstered, speedy, quiet and comfortable; heated by our patent hot water system. We also make all sizes and styles of Stanhopes, Coupes, Traps, Surreys, Brakes, Delivery Wagons, Freight Wagons, Hotel Busses and Coaches.

——WRITE FOR CATALOGUE——

Chicago Motor Vehicle Company

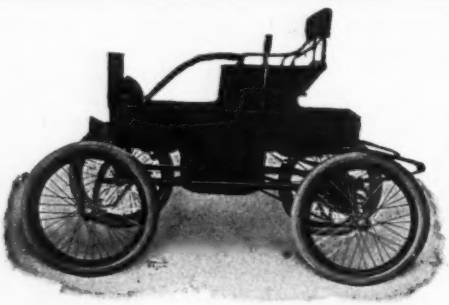
326 Wabash Ave., Chicago, Ill.

Manufacturers of Unequalled HYDROCARBON Motor Vehicles.

THE BAKER

IF IT'S A BAKER IT'S THE BEST

The Most Efficient of all Electric Vehicles



THE LIGHTEST WEIGHT
THE STRONGEST MADE
THE BEST FINISHED

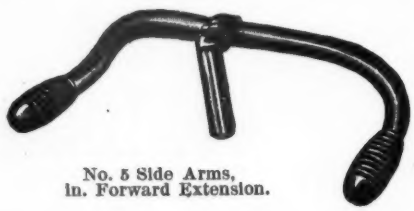
We will send you a Catalogue, or we will write you. Address

The Baker Motor Vehicle Co.,
CLEVELAND, OHIO

1902
Kelly Adjustable **Handle Bars**

STANDARD BARS OF THE WORLD

No. 3 Arms, Regular Stem.



No. 5 Side Arms,
in. Forward Extension.

No. 4 Racing Arms,
2½ in. Forward Extension

It will pay all manufacturers these times when competition is hot, to see that their wheels are equipped with just the attachments demanded by the rider. Every rider knows the merits of KELLY BARS, as they have been for the past six years the most popular and foremost sundry in the cycle trade.

THE KELLY HANDLE BAR CO.

CLEVELAND, OHIO, - - - - - U. S. A.

GATHERED FROM THE FOUR WINDS.

A concern at Toledo is seeking to interest the trade in a pamphlet which claims to present "a series of thirty-four abstracts on the cars exhibited" at the late Paris show. In a copy of the pamphlet sent MOTOR AGE it was found impossible to discover one-tenth of the details furnished by the press of this country and Europe. The pamphlet contains twenty pages and the "abstracts" vary in length from six to forty-eight lines. A good bargain at 50 cents—for the publisher!

Automobile owners of San Jose, Cal., are planning to organize a club. A meeting for this purpose will be called the coming week. At present there are over a score of machines in town and the surrounding country and their number is increasing rapidly. The roads are favorable to the encouragement of the sport and the new club hopes to begin life with a comparatively large membership.

Guy L. Bunch, of the U. S. S. New York, stationed at Manila, writes MOTOR AGE for a large number of catalogues of its advertisers and says: "At present I am serving on board this vessel but am a short-timer and will soon return to civil life and contemplate starting a first class automobile and bicycle repair establishment and to undertake the sale of machines and accessories."

The German government has offered three prizes for the best alcohol vehicles for military uses. They must weigh less than 8 tons, must draw 16 tons on good roads and must be able to cross meadows, plowed fields and go through water 18 inches deep. The tires may be as much as 20 inches wide. They must be ready to be tested in February, 1903, and must be made in Germany.

On account of the large number of orders received for Friedman machines the National Sewing Machine Co., at whose factory, at Belvidere, Ill., they are made, will add 200 or more men to its force. The National company is also pushing preparations for the manufacture of its own machine, which will be a larger and heavier vehicle, of the French type.

Ever since its removal from Ilion to Utica the Remington company has been operating in a temporary plant. The directors have decided to purchase an 80x200 building, one story, and numerous small buildings, which will make it possible to turn out ten complete carriages, ten additional motors and from three to five launches every week.

Nearly all the prominent road houses around New York are preparing to take good care of visiting automobilists this season. Beside carrying a stock of gasoline they are having their establishments fitted with recharging plugs for electric vehicles. MOTOR AGE has received several inquiries from the bonifaces as to the requirements of touring chauffeurs.

The Spaulding company, of Buffalo, was visited by burglars last week. The lock on the company's safe was destroyed and a hole about 5 inches square was sawed in the door of the safe. The thieves failed to get at the valuables within. It is believed they were frightened away when their job was about finished.

One more attempt to make a successful two-cycle motor for automobile use has been made and has failed, this time by a Buffalo house. The men at the head of it were wise enough to drop it without much waste of time and will be ready with a four-cycle engine in about two months.

Representatives O. P. H. Belmont and Ruppert, both of New York, were arrested last week in Washington for exceeding the speed limit. It is not much to their credit that the only defense they attempted, and on which they were freed, was that the police had no right to arrest a member of congress.

Col. George Pope has been elected president of the Wheel Within Wheel Co. This may mean that this concern, whose products aroused considerable interest at the New York show, is to become or has become an A. B. C. sub-company. Your correspondent has not yet had time to investigate.

Frank X. Mudd, treasurer of the Chicago club, has adopted an excellent plan of numbering club pins consecutively, so that if one be lost the owner may have a better chance of recovering it. He keeps a record of the number assigned to each member.

Henry C. Cryder, receiver of the Automobile Co. of America, recently told Vice Chancellor Stevens that the reorganization plans were rapidly maturing and that they would provide for the payment of all creditors in full.

There are 125 motor vehicles owned by N. Y. A. C. members. It is probable that storage facilties will soon be arranged for them at the city house and also at the summer home of the club at Travers Island.

It is possible that the Automobile Club of America may build an experimental stretch of steel road near New York in accordance with Gen. Roy Stone's suggestion in his lecture before the club.

A. L. Dyke, of St. Louis, writes that he has recently received orders from San Juan, Porto Rico, Manila and Cheltenham, England, for his No. 0 and No. 1A outfits, carbureters, coils, etc.

R. M. Owen, manager of the New York Oldsmobile branch, says he is completely sold out, but has fifty-four machines somewhere on the road between the factory and this city.

T. B. Jeffery & Co., of Kenosha, are seeking accommodations for 100 men, having decided to double the present force. This is one of the results of the Chicago show.

Ray Macdonald, ex-cycle racing crack, asks the MOTOR AGE man to tell Tom Cooper that he has a Panhard and will be glad to race against Tom's new 50-horsepower car.

W. K. Vanderbilt, Jr., and De Wolf Bishop spent the night of March 26 in a French police station for fast traveling and failure to light their lamps.

The postmaster of St. Louis has asked the department at Washington to allow him to experiment with the collection of mail by automobiles.

Peter L. Powers has opened an agency at 135 Broadway, New York, for the French Astemotor car.

New applications for licenses in Chicago will be due on May 1.

Albert Champion, the French cyclist, who is training at Washington with Tommy Hall, the English champion, for the coming season, unofficially broke the world's record for a mile on a six-lap track at the Coliseum park on March 30. He rode the distance in 1:25 4-5, a second faster than Walthour's time on the same bowl last year.

It is proposed to have an automobile race at Charles River Park, Boston, on April 19, in connection with the big horse race. Machines of more than 8 horsepower will be barred.

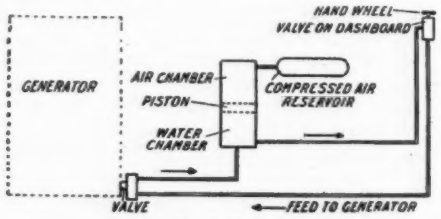
The address of the maker of the Aldrich carbureter is desired by James R. Nisbet, editor of the Motor Car World, 19 Queen street, Glasgow, Scotland.

A Paris automobile has killed a poet. N. B.—The poet was on foot.

SERPOLLET'S SELF-STARTING DEVICE

The Serpollet flash-boiler system, the first of its kind in Europe, has had one serious drawback, namely, the necessity of pumping water by hand to start the vehicle.

The drive from the engine shaft to the road wheels is direct, no clutch being employed, so that, as is the case with almost every steam car, the engine is started



Serpollet's Self-Starter.

and stopped with the carriage. The boiler carries no water, and is only supplied with sufficient to maintain steam by a continuously running pump worked by the engine; consequently, the stoppage of the engine means the stoppage of the pump and of the steam supply.

While the carriage is standing still, the burners remain in operation to keep the coils of the generator hot, and as soon as water is pumped into it, it is instantly flashed into steam, and the engine is restarted, but the only way hitherto to get the water into the generator before the engine was restarted was by working the hand pump.

The self-starter, which is shown in the diagram, consists of a small cast-iron cylindrical receptacle inside the frame, just in front of the engine crankshaft. Into this reservoir compressed air is pumped to a pressure equaling that of the maximum working pressure of the boiler. It will be seen that the air reservoir communicates with the upper part of a large cylinder containing a piston. From the lower part of this cylinder a pipe connects with one from the water tank by means of a valve at the point where it joins the lowest coil of the generator.

The result of this arrangement is that the pressure of steam in the boiler, or what amounts to the same thing, the force of the water pump, opens the valve, and sends water along the pipe to the cylinder, where it raises the piston against the air pressure from the air reservoir, and the two counterbalance each other, the piston maintaining a central position. When pressure falls in the boiler, the valve connecting the cylinder to the generator closes, and consequently the water remains in the cylinder, backed by an air pressure equal to that at which the boiler had been working. Therefore, when it is necessary to restart, all the driver has to do is to turn the small valve on the dashboard, which allows the water beneath the piston to pass up, as shown by the arrow, and then back into the generator by the bottom tube, as the air pressure above in the cylinder drives water into the generator, so that steam can be had without hand pumping. As soon as the vehicle begins running again, water is returned to the cylinder, so that the store of water under compressed air pressure is maintained, as it will be understood that the compressed air in the reservoir which forced the piston down while the water was released for restarting is compressed again as the pressure in the generator rises and forces a sufficient supply of water under the piston. Consequently, the carriage can be repeatedly stopped and started without any perceptible movement on the part of the driver.

A Reliable Tire Fluid

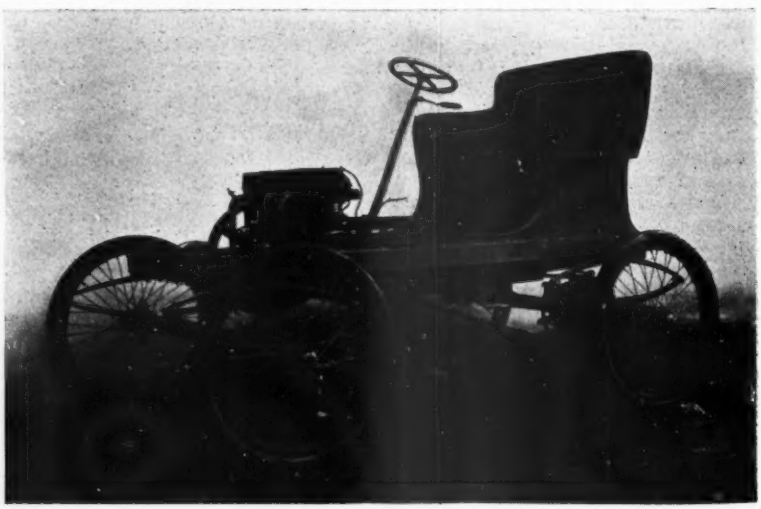
There is no reason why automobilists should be troubled with small punctures. While it would be impossible, of course, to use a preparation which would guard against cuts and so forth, without affecting the resiliency of the tire, the Buffalo Specialty Mfg. Co., of Buffalo, N. Y., manufactures a preparation called Neverleak which it guarantees will absolutely prevent small troubles, will preserve the rubber and fabric and will not prevent plugging or vulcanizing should a severe accident render such a repair necessary. The company will be pleased to furnish further details and such testimonials as will prove the genuineness of its claims.

First Lot of Franklin Carriages

H. H. Franklin & Co., who recently increased their capital to enter the automobile field, are building a new factory on Geddes street, Syracuse, and pending its completion are putting through ten machines at their present quarters. It is a gasoline vehicle propelled by a four cycle, four cylinder, air cooled motor of 7 horsepower. The motor is in front and is covered by a screen. The cooling device has a surface of 21 square feet. The vehicle is fitted with automatic oilers, large bearing surfaces and large crank pins. Ignition is by jump spark, one outfit supplying all four cylinders. The wheels are 28 in., of wire, and the wheel base is 66 in.

One of the Coming Machines

Philadelphia, Pa., March 31.—Editor MOTOR AGE: I have been reading your paper with the object of informing myself how to select the best power to drive an automobile, but have not yet been able to satisfy myself. Some time last summer you gave a description of a vehicle some young men were working on in Chicago, which vehicle was started by electric power, afterwards using an explosive motor. Can you tell me whether



The Franklin Carriage.

"Toledo"

The same care that enters into the construction of the working parts of a *"Toledo"* Steam Carriage is observed in building the frame and body.

The frame is constructed of heavy gauge seamless steel tubing of 1¾ in. outside diameter.

The wheels are extra heavy with large hubs and large diameter spokes. Three-inch tires are fitted.

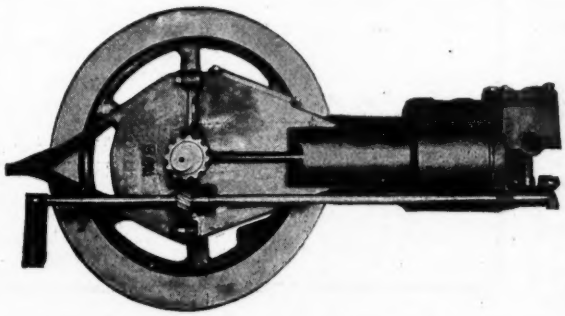
A non-vibrating steering lever obviates an unpleasant feature of other lever steering vehicles.

A double band brake is fitted to *"Toledo"* Carriages, thus increasing the factor of safety 100 per cent.

International Motor Car Co.

NEW YORK BRANCH: 91 FIFTH AVENUE.
CHICAGO AGENCY: 1412-1414 MICHIGAN AVENUE.

TOLEDO, OHIO



Our New Runabout Engine No. 2

Made the "Hit" at the Chicago Show. Cylinder 4½x6 in.; same size as that used in the popular light wagons of the day.

$160.00 IS THE PRICE.

With two-speed forward and reverse spur gear transmission. Where other transmissions use ¾ in. and 2 in. bearings on shaft we use 2⅞ in. and 4 in. respectively. How does that strike you—and all for $160.00.

We are making prices to manufacturers of vehicles in quantities that are sure to get your business. If you are in the field for motors and transmissions in tens, twenties or hundreds, write us—straight business only.

Our new motor No. 3, cylinder 5¼ by 6½ will be ready in thirty days, with or without transmission. Same general design and dimensions over all in length and width. Get quotations in quantities with and without accessories.

THE P. J. DASEY CO.

19-21 La Salle St., - - - CHICAGO, ILL,, U. S. A.

The largest crowd at the Chicago Automobile Show was always at the

FOURNIER-SEARCHMONT EXHIBIT

WHY?

The Fournier-Searchmont exhibit contained the handsomest and most up-to-date cars in the show.

...RUNABOUT	TOURING CAR	TONNEAU ....
$1200.00	$1500.00	$2250.00

.....LET US SEND YOU A CATALOG.....

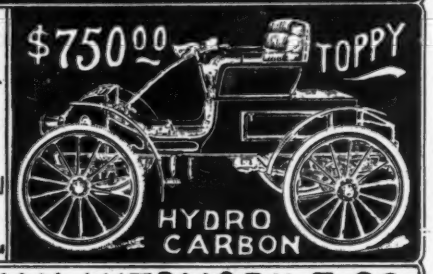
Fournier-Searchmont Automobile Co.

1238 Orkney Street, PHILADELPHIA, PA., U. S. A.

ABSOLUTE AND INSTANTANTEOUS CONTROL—FOOT STARTER FROM SEAT

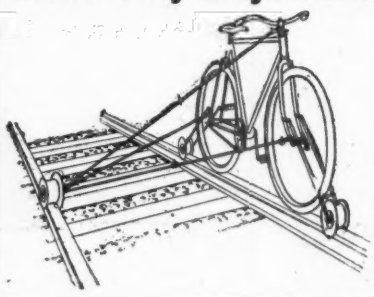
STRONG
LIGHT
COMPACT
SIMPLE

SOLD THROUGH AGENTS ONLY



FRIEDMAN AUTOMOBILE CO.
3 E. VAN BUREN ST. CHICAGO. ILL. ASK US.

...The Coey Bicycle Attachment...



Better than ever. We now make three different styles

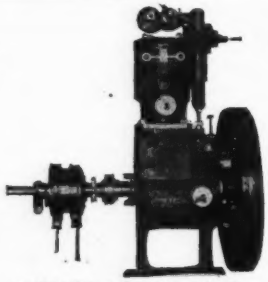
Write for circular and agency

C. A. COEY & CO.
177 LaSalle St.
CHICAGO, - ILL.

DON'T EXPERIMENT

Get an outfit which is designed to go together. You can't make a successful rig by buying parts at random.

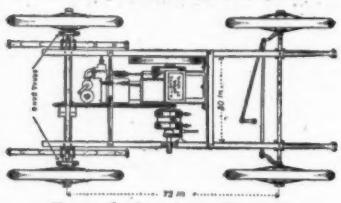
DYKE'S NO. 1 AUTOMATIC.
Made up from Outfit No. 1.



Dyke's No. 1 Gasoline Engine with transmission direct connected

DYKE'S FLEXIBLE REACHLESS RUNNING GEARS are UNEQUALLED

.....Make note of Brake Pulley.....



Top and plan view. Showing manner in which our engine is mounted

We supply you with all the parts to build this machine. We also supply parts for larger machines. We have customers from Maine to Mexico who have built these machines and who have sent in testimonials stating that they were more than pleased. We originated this line of business three years ago.

FULL LINE AUTO SUPPLIES.
CHAS. E. MILLER, 97 Reade St., N. Y. Representative.

A. L. DYKE, Manufacturer, ST. LOUIS, MO.

they have yet developed it?—Yours, etc., C. E. Albright.

The vehicle referred to has not yet been placed upon the market. Arrangements are in progress, however, for its manufacture in another city, by a concern whose reputation is a guarantee that when it is finally marketed it will be in a successful form. We are not yet at liberty to publish the name of the maker. At the time of the publication of the article referred to by Mr. Albright doubt was expressed by several correspondents and others as to the practical working of the vehicle. For that reason further inquiries were made and the machine was examined for MOTOR AGE by a number of experts, all of whom acknowledged its apparently excellent qualities and none of whom was able to dispute the claims of its designers.

Construction of a Motor Bicycle

ST. PAUL, MINN., March 30.—Editor MOTOR AGE: I have a copy of MOTOR AGE of August 1, showing some parts of a bicycle motor. I would like to know what date the issue was published in which the drawings for the brackets, for fastening the motor to the frame, were illustrated and described; also what kind of dry batteries to use, and also at what date the primary circuit breaker was illustrated. Can you supply me with the issues in question?—Yours, etc., J. D. Mooney.

The issues pertaining to the construction of a bicycle motor have been called for so often that none remain on hand. The article began in the issue of June 27. In the issue of July 25 an article appeared which was devoted to the construction of the electrical ignition apparatus. Any good dry cell will serve the purpose.

Questions for Electrical Experts

Decatur Ill., Mar. 30.—Editor MOTOR AGE: I have an electric automobile with the battery of which I am having some trouble, and perhaps you or some of your many readers can give me some useful advice. The plates of my battery have expanded so much vertically that they have raised some of the cork covers until the lower edges of same are above the tops of cells, allowing the electrolyte to slop over and soak the trays and bottom of wagon with sulphuric acid. Otherwise the battery is in good order and I do not feel like going to the enormous expense of new plates and covers. The battery has gone less than 1,000 miles. Can I fill the cells with electrolyte, say ¼ higher than normal, after having removed the present covers, and then pour on top of the fluid about ½ " of melted paraffine, having first placed a core of suitable material to provide a hole for the necessary addition of electrolyte occasionally? After the paraffine has cooled, enough electrolyte could be removed to bring same to normal level. Is there any objection to providing tight covers in this way? Is it not good practice to wash the battery trays and bottom of wagon after same have been wetted with electrolyte with strong sal soda solution until all effervescence has ceased, and would it be objectionable to occasionally paint trays and bottom with strong solution of sal soda to neutralize any acid that might occasionally slop or creep over? Sulphuric acid, from its nature, never dries, except by soaking into wood and combining with it. Sal soda dries out, and I believe will not injure the wood to any great extent, and sulphate of soda, even if it does not dry, I believe is inert. Am I right in this?

My battery has four trays of 20 volts each and to one tray is permanently attached a 20-volt lamp for headlight. Would it not be better to use a 40-volt lamp connected across two of the trays and to connect another 40-volt lamp across the other two trays, whether needed or not, so as to equalize the work of the separate trays?

If you will kindly answer the above question either by letter or through the columns of the MOTOR AGE, or if you will insert this letter in the next issue and permit some of your readers to reply, you will confer a great favor.

On slow speed my battery is in multiple series, 40 volts, while on high speed it is in plain series 80 volts.—Yours, etc., Frank Shlaudeman.

A Testimonial Worth Reading

The G & J Tire Co. has lately issued a high grade catalogue of its high grade tires. That they are high grade is not open to doubt in the mind of any man who has tried them or has had experience with the house which makes them. Perhaps no more convincing testimonial was ever written than that of the Crescent Cycle & Automobile Co. of Jersey City which, with one brief omission, is here reproduced:

We purchased from the American Bicycle Co. this year, says the writer, ten Waverley carriages. On one we noticed that the running qualities were very bad, as every one of the other carriages purchased by us would run much farther than this particular carriage. We called the attention of the American Bicycle Co. to the same and they furnished us three different motors for the carriage, also one new set of batteries, and had the carriage thoroughly overhauled. We went over the carriage time and time again trying to locate the trouble until at last we noticed that this carriage was equipped with ——— tires and the other nine carriages were equipped with G & J clinchers. We took one carriage equipped with G & J tires and a carriage equipped with ——— tires, and in one mile straightaway on the Hudson County boulevard showed a difference of four blocks in a mile. We brought the two carriages home and exchanged wheels, putting the G & J tires on the carriage that had run slow and ——— tires on the other. Going out again we found the difference exactly reversed. The carriage that ran slow with the ——— tires on ran four blocks faster in the mile than the other one. This showed us conclusively that it was a question of tires. We at once got a set of G & J tires and equipped the carriage with them, and at the present time it is running as good as anything that we have in the city. This has made us a firm believer in your goods, and we trust that the carriages we handle next year will have G & J tires on them.

Coey Embarks in Automobile Business

At 5311-13 Cottage Grove avenue, Chicago, there now stands a building which is said to be the first in the United States erected solely for use as an automobile livery and repository. It is the establishment of C. A. Coey & Co., who house there ten vehicles of their own construction and used solely for the purpose of renting. The firm charges a fee of $10 for teaching patrons how to run an automobile. This price includes the license fee, and after they have secured their license they can rent them the same as a person would rent a horse and buggy. They have expert machinists to do repairing in all of its branches and make a specialty of cleaning batteries and replacing defective cells.

Coey & Co. have their own plant for generating electricity. Their place is open night and day. They have a beautiful suite of offices, with a waiting room exclusively for ladies; are located across the street from Washington Park, and but six blocks from the renowned Midway, which leads from Washington Park to Jackson Park, the old World's Fair ground. The station is in full view of the most fashionable drive in Washington Park, surrounded by boulevards and

beautiful drives, and a more perfect location for an automobile station could not be selected in the city.

In addition they have secured the agency for a few first-class automobiles, electric, gasoline and steam, and as to responsibility refer to any prominent business house in Chicago, the First National Bank, Dun's or Bradstreet's. They have lots of energy and facilities for selling automobiles. While they have secured some desirable agencies, they are open for a few more. They are very particular in not securing two makes of the same class.

Fournier on Good Roads

The following truism is attributed to Fournier:

"Roads are civilization itself. How did Rome conquer Gaul? By roads. The tribes in their forests imagined they were inaccessible. One morning, when they awoke and rubbed their eyes, instead of a wall of foliage they saw a road. Rome was there. Good roads mean business for the cities, business for the farmers, and business for everyone. A farmer who lives 5 miles from town is practically isolated from the ouside world 3 or 4 months in the year if an old fashioned trail passes his home, but if that trail has been developed into a permanent and practical highway, he is merely living in the suburbs of the city and can reach it quickly at any time."

Iowa Road Bill Ridiculed

The Iowa senate riddled an automobile bill with amendments, last week, and finally referred it to a committee, with the evident intention of making it harmless. The bill originally provided for registration and the payment of a fee of $1, a maximum speed of 8 miles an hour and the strict observance of the requests of owners of restive horses.

The registration feature was removed after a short debate, as was the license provision. One of the legislators said that under the proposed section any mischievous boy driving a spirited horse could get in front of an automobile and by raising his hand keep that vehicle back of him for miles

Another raised the question whether a man who was one-armed would be able to stop an automobile under this section. He also wanted to know who was to be the judge of whether a horse or horses were restive or not. He called attention to the fact that if a party of persons were driving together and the horses become frightened at an automobile no person but the driver could signal the vehicle to stop and his attention would be claimed by the team he was driving.

In one part of the section there was a reference to persons "driving domestic animals on the highways." He said this might apply to cattle and hogs being driven in numbers on the highways and automobiles would have to give way to them. He discovered that the section did not provide for stopping automobiles crossing at street intersections, and at this juncture the bill had been so thoroughly riddled that it was referred to the judiciary committee.

Dealers Arrange Interesting Contest

PROVIDENCE, R. I., March 31.—That the coming season will be very lively in automobile circles in this city is apparent from the fact that up to date H. G. Martin & Co. have received orders for seventeen of the new Winton touring cars from local people. When these cars arrive Mr. Martin will inaugurate an interesting contest among the owners. A series of races will be held in which the winners will be awarded points and at the end of the season silver cups will be presented to those having the high number. The races will only be open to the Winton touring car class and the contest will be a test of the operators' skill and nerve, as all the machines are exactly alike and will be, when received, of equal speed. It is expected that a race open only to these machines will be one of the events of the annual race meet of the Rhode Island Automobile Club. Martin & Co. will in a few days move to new quarters at the junction of Dorrence, Worcester and Eddy streets, where the firm will have a capacity for seventy-five carriages. The old quarters will be kept as a machine shop, as it is especially adapted for this purpose, having one of the finest equipments in the state for building and repairing vehicles.

COEY
AUTOMOBILE-LIVERY & REPOSITORY
AUTOMOBILES RENTED BY THE HOUR, DAY, WEEK OR MONTH
AUTOMOBILES STORED & DELIVERED TO ALL PARTS OF THE CITY

Ford Makes a New Start

Henry Ford, of Detroit, has left the Henry Ford Automobile Co. and is building a new racer for himself. The new racer, he thinks, will be much faster than the old machine, as he has corrected several things which were wrong in the first machine he turned out. It will not be ready for use before July, in all probability.

A SERIOUS QUESTION

Why should bicycle dealers encourage the development of any device which will lessen their profits? Since the adoption of the

CUSHION FRAME

makers and dealers have had a new stimulus which increased both sales and profits. Will it be wise to sacrifice these profits by reducing prices? You will surely do this if you encourage any substitute for the

CUSHION FRAME.

Our methods have helped you make money, and will continue to do so if you fully appreciate the seriousness of our arguments. It is well to please both yourself and your customers, for one cannot live without the other.

HYGIENIC WHEEL CO.

St. Paul Bldg., New York City.

SHELBY SEAMLESS

STEEL TUBING

Is the recognized Standard for Automobile and Bicycle construction.

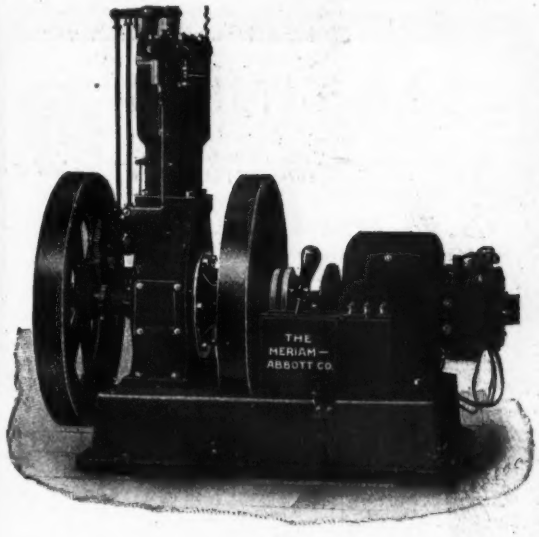
Loss in manufacture will be reduced to a minimum and stability of product secured by the use of

SHELBY TUBING

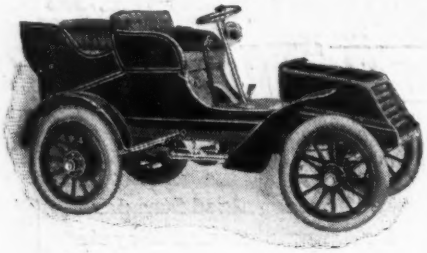
SHELBY STEEL TUBE CO.

PITTSBURGH, PA.

Western Office:
WESTERN UNION BUILDING, CHICAGO.



ELECTRIC CHARGING PLANTS
For AUTOMOBILES and LAUNCHES
"SELF STARTING"
Write us for prices etc.
MERIAM-ABBOTT CO.,
CLEVELAND, O.



Winton Touring Car

The pleasing advantages in automobile building—resulting from brains, experience and expensive materials—are represented in its construction. It combines Strength, Durability, Beauty, Simplicity of Construction, Accessibility to all Parts, Ease of Adjustment, Low Center of Gravity, Long Wheel Base, Easy Steering and Comfortable Riding, Automatic Lubrication; Absence of Vibration, Heat and objectional odors. Satisfactory Ignition and Combustion, Reliable Brakes, etc.

Our Catalogue may help some.

THE WINTON MOTOR CARRIAGE CO.

CLEVELAND, U. S. A.

"The Milwaukee" MOTOR VEHICLES

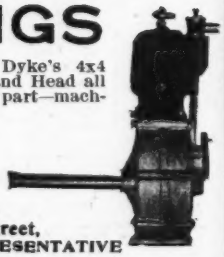
ARE

"THOROUGHLY EFFICIENT"

MILWAUKEE AUTOMOBILE CO.
MILWAUKEE
Chicago Salesrooms, 373 Wabash Ave.

CASTINGS

and working drawings of Dyke's 4x4 Gasoline Engine—Cylinder and Head all in one casting. We sell any part—machined or in the rough.



A. L. DYKE,
Manufacturer
St. Louis, Mo.

Chas. E. Miller, 97 Reade Street,
NEW YORK REPRESENTATIVE

SCREWS ON TO VALVE
AUTOMOBILE NEVER LEAK TIRE FLUID
PATENTED
June 17th 1890
March 9th 1897
FOUNDATION PATENTS
THE ONLY COMPOUND THAT CAN BE LEGALLY USED IN A PNEUMATIC TIRE
BUFFALO SPECIALTY MFG. CO.

Tire Troubles Stopped!

By injecting one tube of **Automobile Neverleak** into each of your tires your tire trouble will absolutely cease. **Automobile Neverleak** will preserve the rubber and fabric and will not prevent plugging or vulcanizing, should a severe accident render such repairs necessary.

NEVERLEAK

is used and recommended by Tire manufacturers and is the only liquid that can be legally used in any pneumatic tire.

BUFFALO SPECIALTY MANUFACTURING CO.
Sole Proprietors,
BUFFALO, - N Y.

IF You are looking for the best ideas in the

SPARK COIL

line, send for Catalogue.

DOW PORTABLE ELECTRIC CO.

218 TREMONT STREET, - BOSTON, MASS.

1135 Broadway N. Y.
1213 Filbert St., Philadelphia, Pa.
21 La Salle St., Chicago, Ill.

Motor Age and Cycle Age

MOTOR AGE, with which is incorporated CYCLE AGE, is published every Thursday at rooms 400-409 Monon building, 324 Dearborn street, Chicago, by Samuel A. Miles. It is entered at the Chicago postoffice as second-class matter.

* * *

The domestic subscription price is $2 a year; foreign subscriptions, $4 a year; single copy, 5 cents. The advertising rates, based on a guaranteed circulation of 5,000 copies, are as follows:

SPACE	One insertion	Discounts	7 issues	13 issues	26 issues	52 issues
1 Page...	$30.00	7 issues 10%	$27.00	$25.50	$22.50	$20.00
½ Page...	18.00	13 " 15%	16.20	15.30	13.50	12.00
¼ Page...	12.00	26 " 25%	10.80	10.20	9.00	8.00
⅛ Page...	7.50	52 " 33⅓%	6.75	6.40	5.65	5.00
1 Inch...	4.00	Net rates in following cols	3.60	3.40	3.00	2.65

All MOTOR AGE advertising contracts bear this endorsement:

This contract is based on the assurance of the publisher of MOTOR AGE that its circulation shall regularly exceed 5,000 copies, and that if it falls below that number there shall be a proportionate reduction in the advertising rate without request on the part of the advertiser. The publisher will furnish reasonable proof of circulation when called upon by an advertiser so to do.

* * *

The circulation of last week's issue was 5,150 copies, 4,556 copies, weighing 948 pounds, were mailed, as shown by the postoffice receipt. The remainder were distributed by the Western News Co. and the employes of the paper.

* * *

The postoffice receipt for the week, which will enable any one to check the circulation, is as follows:

No. 311A. POSTOFFICE AT CHICAGO, STATE ILL.
Date March 29, 1902.

Name of publication, MOTOR AGE.
Total subject to postage at one cent per pound.....$9.48
Received full prepayment of postage.
(Signed) F. E. COYNE, P. M.
By T. M. K.

The editor will be glad to receive communications for publication. They must be accompanied by the names and addresses of senders, which will not be used if request be made to that effect. Contributions will not be paid for unless accompanied by notice that payment is expected.

Automobiles and Cycles Gone Abroad

Washington, D. C., March 26.—The exports of bicycles for the week just ended from the port of New York were as follows: Antwerp, bicycles and material, $1,131. Athens, bicycles, $200. Argentine Republic, bicycle material, $49. Amsterdam, bicycles, $3,940; bicycles and material, $295. British East Indies, bicycles and material, $2,293. Bremen, bicycle material, $165; bicycles, $40; sporting goods, $68. British Guiana, bicycles and material, $31. Brussels, bicycles, $213. British West Indies, bicycles and material, $1,658; sporting goods, $113; velocipedes, $22. British Post in Africa, bicycles and material, $31. Cuba, bicycles, $82. Chili, velocipedes, $36; bicycle material, $110. Christiania, bicycles, $1,065. Copenhagen, bicycles, $525. Drontheim, bicycle material, $111. Danish West Indies, bicycles and material, $22. Dutch West Indies, bicycles, $114. Egypt, bicycle material, $50. Gothenberg, bicycles, $2,890. Glasgow, bicycles, $35. Geneva, sporting goods, $245; bicycles, $75; bicycle material, $660. Havre, bicycles and material, $215; bicycles, $521. Hull, bicycles, $195. Helsingford, bicycles, $450. Hamburg, bicycles, $3,370; bicycle material, $516; velocipedes, $24. Hango, bicycles, $375. London, bicycles, $1,478; bicycle material, $9,462. Liverpool, bicycles, $846; bicycle material, $1,392. Malta, bicycles and material, $00. Milan, bicycles, $600. Peru, R. R. velocipedes, $50. Rotterdam, bicycles, $109; bicycles, $1,685. Southampton, bicycle material, $2,982. Turin, bicycles, $2,500. Toulouse, bicycles, $200. San Domingo, velocipedes, $12. Stockholm, bicycle material, $200. St. Petersburg, bicycle material, $275; bicycles, $358.

The exports of automobiles were as follows: British East Indies, automobile vehicles, $1,200. London, motor vehicles and parts, $21,934. Mexico, automobile vehicles, $1,450.

Simple Driving Gear

Louis Creanche, of Paris, France, is the inventor and patentee of an extremely simple method of power transmission for light carriages. The motor and its appurtenances are carried on an auxiliary frame, so secured to the main frame of the vehicle that it may be moved longitudinally of the main frame by means of a lever provided for that purpose. The transmission gearing comprises a broad faced pulley on the motor shaft, two pulleys loosely journaled on a secondary shaft, each carrying a sprocket from which chains connect with two sprockets on the differential gear on the rear axle. The connection between the pulley on the motor and the two pulleys on the secondary shaft is by belt and by shifting this belt to one or the other pulley, either may be driven by the motor. The two sprockets on the above pulleys and their respective sprockets on the differential are of differing ratios, so the ratio of drive between the motor and the differential may be varied as the belt is running on one or the other pulleys. To release the motor entirely from driving connection with the vehicle the frame carrying the motor is moved toward the secondary shaft, thereby loosening the belt and rendering it inoperative.

MISCELLANEOUS

Advertisements under this head 5 cents per word first insertion; 3 cents per word each insertion thereafter. Cash with order. Express orders, postoffice orders or stamps received.

FOR SALE

FOR SALE—The Automobile Storage and Repair Co., 57 West 66th St., New York, have new and second-hand steam, gasoline and electric carriages constantly on hand and have always some special bargains.

FOR SALE—12-h.p., 1902 model, electric ignition Panhard; body by Kellner. S. A. M., care of MOTOR AGE.

FOR SALE—A two-seated Locomobile in good condition; panel back seats; water glass on tank and other improvements. Will W. Morrison, Bryan, Ohio. 14

FOR SALE—One new guaranteed 4 horse-power single cylinder gasoline water-cooled automobile or marine motor for $95; one new guaranteed 7 horse-power automobile or marine motor for $150. H. L. Hoffman Motor Co., Plainfield, Ill. 14

FOR SALE—Indian curios; 125 pieces, including Pima baskets and pottery, Navajo blankets, beadwork, etc. A. P. Meriwether, M. D., Shipman, Ill. 14

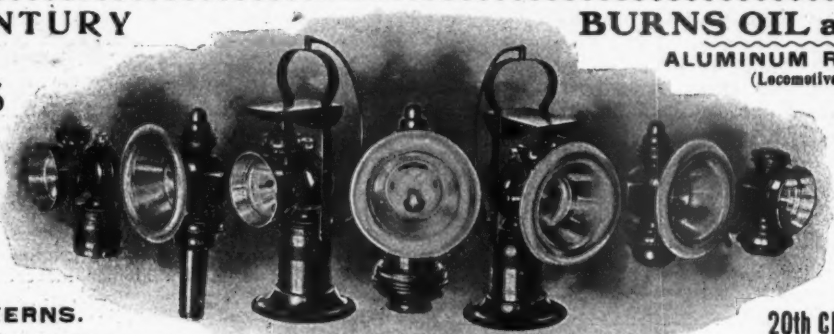
FOR SALE—Two demonstration carriages; model No. 1, price $410; model No. 2, prize $485; neither can be distinguished from a new machine. Loomis Automobile Co., Westfield, Mass. 14

FOR SALE—Orient tricycle and quadricycle, with 2¾-h.p. De Dion engine; first class condition. W. A. Carr, 819 Wright St., Indianapolis, Ind. 14

FOR SALE—Star lathe, 9-inch; brazer, vulcanizer, oven and bicycle repair tools. W. T. Stetson, Cambridge, Wis.

FOR SALE—Second hand motorcycle or motor bicycle. Walter Cox, Box 435, Denver, Colo. 14

20th CENTURY
HEAD
LIGHTS
FOR
BICYCLES,
CARRIAGES
AUTOS,
BOATS, etc.
and as
Special
Purpose
HAND LANTERNS.
SEND FOR 1902 CATALOGUE



BURNS OIL and GAS
ALUMINUM REFLECTORS
(Locomotive Class)
NICKEL,
BRASS
AND
GUN METAL
FINISH.
See the New Gun Metal Finish.
—o—
20th CENTURY Mfg. Co.
17 Warren St., New York

NATIONAL
ELECTRIC VEHICLES

Model 60. Price $850.

Eight Models at prices ranging from $850 to $1100

Our vehicles are in no sense experimental. We have had years of broad experience in all lines of automobile work and have applied to our product the best modern practice in every detail and particular. :: :: It is our purpose to establish agencies in all important centers, and we are prepared to consider applications from persons having sufficient capital and suitable facilities for the proper conduct of the business.

CATALOGUE FREE.

NATIONAL VEHICLE CO.,
1200 E. 22d Street, • • INDIANAPOLIS, IND.

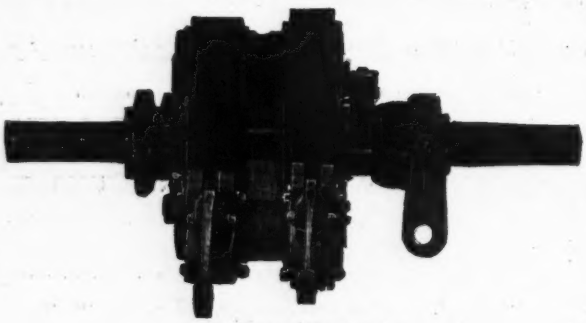
ALL ROADS ALIKE to

THE OLDSMOBILE
RUNS EVERYWHERE

It's the thoroughly practical Motor Vehicle—emphasize that word **practical**—for every day in the year. Spring, Summer, Autumn, Winter, The Oldsmobile is always instantly ready for starting, with the power to keep everlastingly going. **Price $650, f. o. b. Detroit**

Illustrated descriptive book mailed free on request.

THE OLDS MOTOR WORKS
50 Concord Ave. Detroit



UPTON SPECIAL.

Transmission Gear.

TWO SPEEDS FORWARD
AND A REVERSE . . . . .

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Faith in one's own product is one of the secrets of success in marketing. We have unqualified faith in THE WOODWARD BURNER. :: It has a record of **Fifteen Miles on One Gallon of Gasoline.** :: Its construction is scientific. Its top plate is flexible and Tubes screw in bottom plate, and if for any cause Tubes have to be removed all that is necessary is a wrench. It makes no carbon. It cannot backfire—absolutely impossible. It makes steam so that even on hills you have enough and to spare. Its flame is blue and twelve inches long, which means that it gives more heat than other burners. It is durable—will last as long as any other part of the vehicle. We guarantee this. :: For proof of any and all claims here made we refer to the boiler itself. :: It will prove them to your satisfaction if you will give it a trial.

The Woodward Burner & Specialty Works
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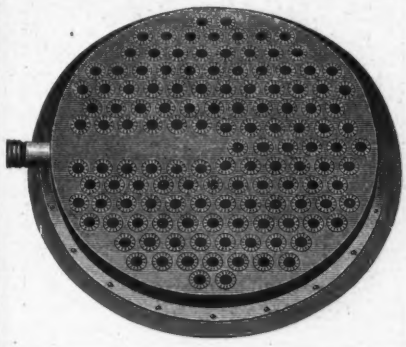

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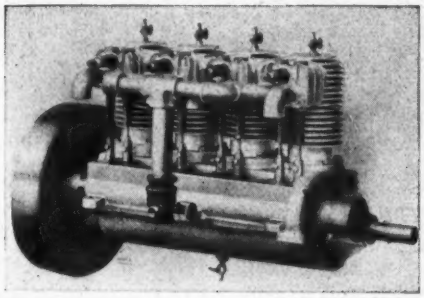

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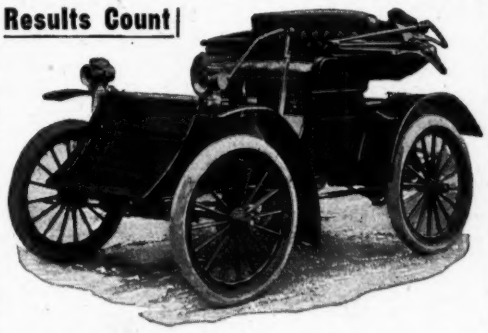

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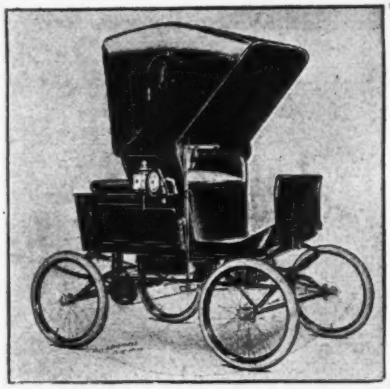

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Model 65.

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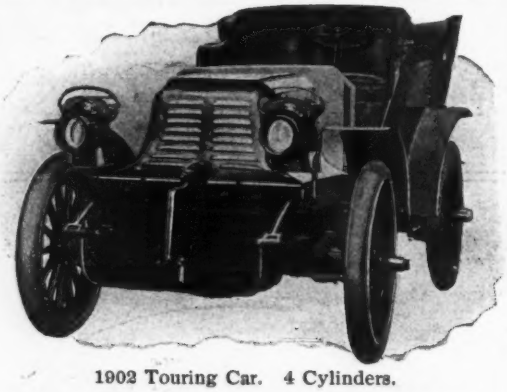

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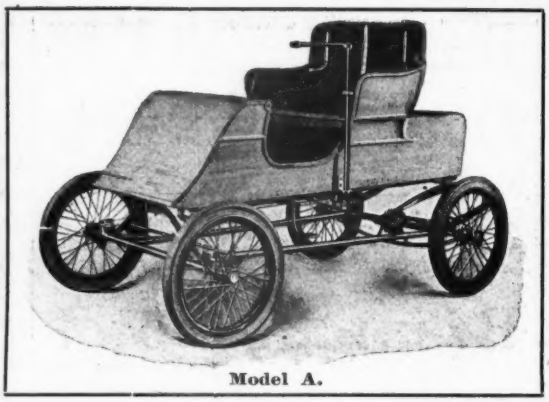

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Can furnish parts for any of the above models, including Mechanical Tires, complete sets of Wheels, Running Gear, Bodies, six models, Entire Wagon ready for power including Brake and Steering, furnished in best baking enamel on all metal parts. All wood parts best varnish finish. Upholstered in leather or cloth. Also Reachless Running Gears, and specially designed bodies for gasoline vehicles.

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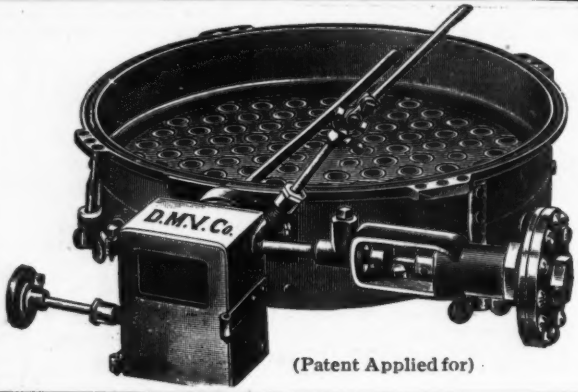

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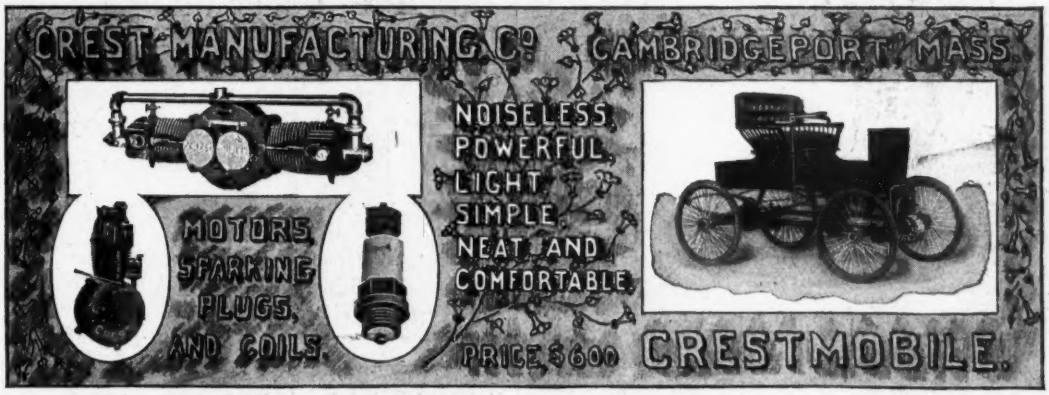

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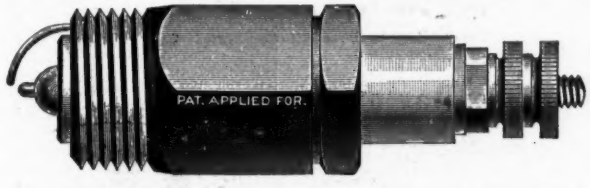

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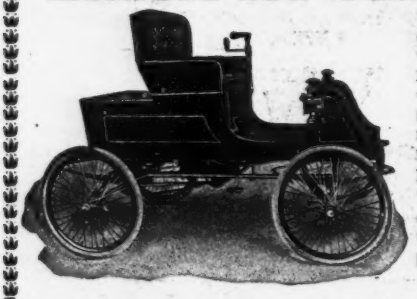

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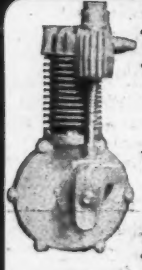

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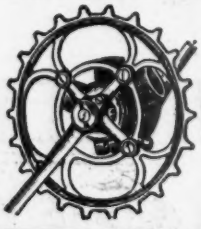

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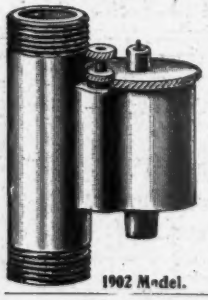

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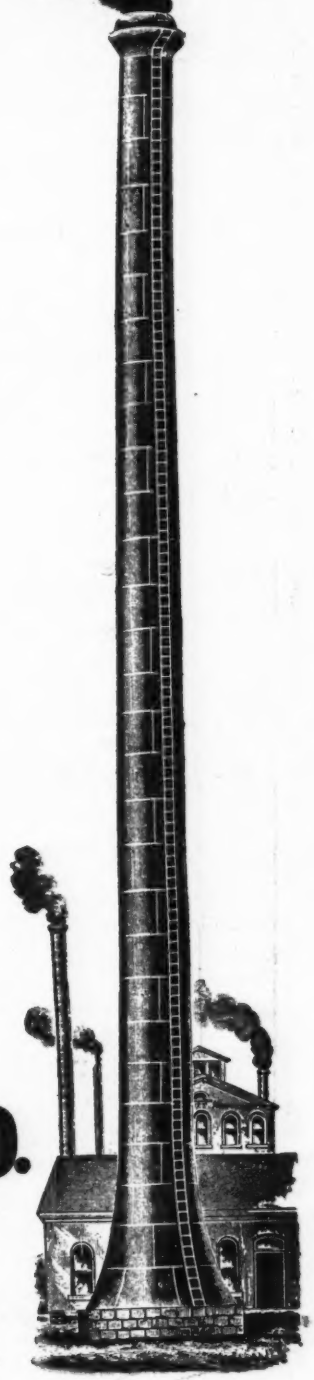

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